Service Manual

17-inch LCD Monitor
AL1702

Service Manual Versions and Revision

No.	Version	Release Date	Revision
1.	1.0	May 12, 2004	Original release

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1) Circuit Description

1. Power Board Operation

1.1 Line filter consists of C801, T801, C802, C803, C804. It eliminates high frequency interference to meet EMI's requirement.

1.2 Rec & Filter

Bridge diode D801 converts AC source into pulsed DC. This pulsed DC is smoothed and filtered by C805. R802 is an NTC (negative thermal coefficient) resistor, used to reduce inrush current to be within safe range.

1.3 Power transformer :

T802 converts energy for square wave from power source C805 to secondary side to generate +12V and +22V.

1.4 Output :

The square wave from T802 is rectified by D809, D811, then filtered by C822, C817 to generate +12V and +22V respectively. I804 is the regulator for +5V output.

1.5 Driver :

Q803 drive T802 from PWM control of I801 for power converted.

1.6 FB :

Negative feedback CKT consists of photo coupler I802 and adjustable regulator I803. It can maintain output voltages +22V and +12V at a stable level.

1.7 PWM :

1.7.1 Start : When power is turned on, Q801 conducts due to bias from C805 and R805,R803. C807 is charged a 16 volt and a starting current about 0.3mA to pin 7 of I801. I801 starts to oscillate and outputs a pulse train through pin 6 to drive Q803.

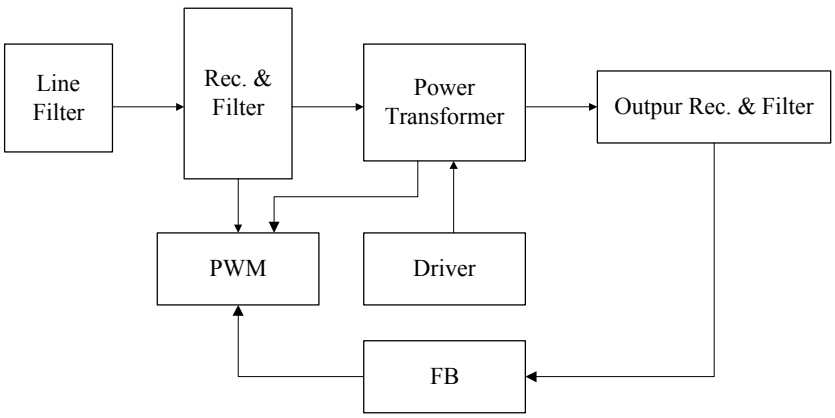
1.7.2 OPP : When Q803 turns on, C805 supplies a linearly increasing triangle current through the primary inductance of T802 to the driver Q803, once the peak value of this current multiplied by R811 exceeds1 volt, pulse train will be turn off immediately to protect Q803, T802 from being burned out.

1.7.3 Regulation : If output voltage +22V or 12V goes up, the R terminal of I803 gets more bias, accordingly photo transistor and photo diode flows more current. The voltage of pin 2 of I801 goes up too, making the pulse width of pin 6 of I801 to become narrower. So the output voltage +5V will be pulled down to a stable value.

1.7.4 OVP : If +22V or 12V goes up too much, the induced voltage on pin 4 of T802 becomes large also. Suppose that it is over 18 volts, ZD801 conducts, pin 3 of I801 is pulled up over 1 volt. The pulse train at pin 6 of I801 goes down to zero, shutting Q803 off immediately.

1.7.5 SCP : If output terminal is short to ground, photo transistor does not conduct, hence Q806 does not conduct either. Then oscillation of I801 is stop, shutting Q803 off immediately.

Power Board Block Diagram



2. Inverter Operation

This unit operates on an output voltage of 22V from power source.

2.1 VCC: When On/Off pin of P802 is high level input, Q106 turns on and provides +5VDC for I101 power supply.

2.2 Control IC: I101 (OZ960S)

2.2.1 Enable : When pin 3 of I101 is over 1.5V, I101 works. If it is under 1.5V, I101 turns off.

2.2.2 OSC: When I101 enabled, R108/C115 (pin 17/pin18 of I101) determine the operating frequency.

2.2.3 SST: C104 (pin 4 of I101) provides soft start function.

2.2.4 Ignition: R109 (pin 8 of I101) provides higher operating frequency for more striking voltage until regulation of feedback of lamp current. C103 (pin 1 of I101) determine the striking time.

2.2.5 Dimming control: The divided voltage of R106/R105/R104 control the duty pulse of burst-mode to drive Q105 and perform a wide dimming control for the CCFL. The burst-mode frequency is determined by C116.

2.2.6 Regulation: Pin 9/pin 10 of I101 provide regulation of the CCFL current from feedback. The non-inverting reference (pin 10 of I101) is at 1.25V nominal.

2.3 Protection: Open-lamp protection in the ignition period is provided through both pin1 and pin 2 of I101 to ensure a rated voltage is achieved and a required timing is satisfied.

Removal of the CCFL during normal operation will trigger the current amplifier (pin 9/pin 10 of I101) output and shuts off the inverter. This is latch function.

2.4

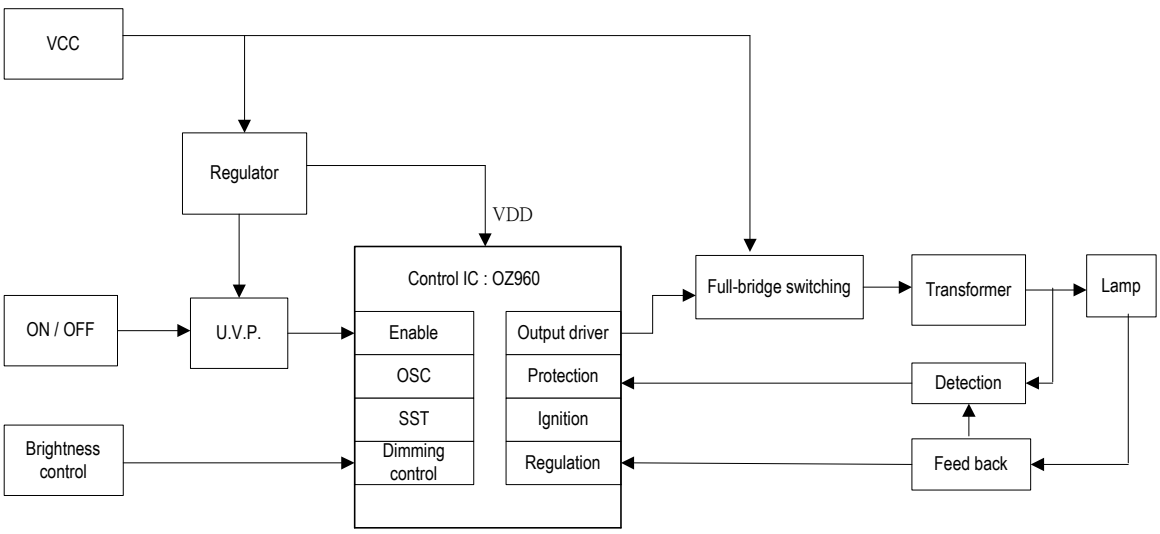
2.4.1 Output drivers: The configuration prevents any shoot-through issue associated with bridge-type power conversion applications. Adjusting the overlap conduction between I102 P-MOSFET and I103 N-MOSFET, I101 N-MOSFET and I103 P-MOSFET, the CCFL current regulation is achieved.

2.4.2 Full-bridge switching/Transformer: I102/I103 /C123/T101 compose full-bridge switching to convert DC into AC for driver the CCFL.

2.5 Detection: C128/C129/C132/D115/D114/C118 detect the output voltage and ensure a rated voltage by pin2 of I101.

2.6 Feedback: D116/D117/R120/D108/R116 sense the lamp current for negative feedback and regulation. The divided voltage on R116 will be at 1.25V.

Inverter Circuit Block Diagram



3. Interface Operation

3.1 Top (Circuit diagrams MAIN PWB 2 of 8)

This page is function block. (1) power. (2) VGA & DDC interface. (3) scaler MST8111B. (4) panel interface. (5) audio (option).

3.2 Power (Circuit diagrams MAIN PWB 3 of 8)

3.2.1 P301 connector

A 5V power supply for LCD module, MCU, logic. And a 12V power supply for audio function. It is generated from the P301 connector.

3.2.2 I301 : 3-terminal regulator

A 2.5V power supply for scaler IC I305, it is generated from the 5V source.

3.2.3 I302 : 3-terminal regulator

A 3.3V power supply for scaler I305, it is generated from the 5V source.

3.2.4 Q303, I312 : ON/OFF control for LCD module power

ON/OFF control (PANELVCC_EN) is performed for power ON/OFF and also for the power saving sequence.

3.2.5 R306 : ON/OFF control for LCD module back light power

ON/OFF control (BKLT_EN) is performed for black light power ON/OFF and also for the power saving sequence.

3.2.6 Q301,Q302 : Adjust back light luminance for LCD module

It is adjusted back light luminance control (BKLT_ADJ) is performed for the back light luminance.

3.3 VGA & DDC interface (Circuit diagrams MAIN PWB 4 of 8)

The analog video signals input, the AC-coupled video signal video signal is used to clamp the black level at 0V. and H/V sync to sclaer, and DDC plug & play function.

3.3.1 P302 connector

The video input signals from the P302 connector.

3.3.2 I304DDCEEPROM

This IC is support DDC2B of the VESA standard, also plug and play for the PC host.

3.4 Scaler MST8111B (Circuit diagrams MAIN PWB 5 of 8)

The I305 is scaled converter LSI for the LCD monitor.

The analog R, G, B signal input entered from the video input circuit is converted into the digital data of video signal through the incorporated A/D converter. Based on this conversion, this device performs interpolation during pixel extension. These interpolation digital data are transformed to LVDS signal. The I305 source voltage is 3.3V and 2.5V, the device clock frequency is 14.318 MHz. The device control signal is from MCU through the 3-wire bus.

The I305 scaler has support OSD function.

3.5 Panel interface (Circuit diagrams MAIN PWB 6 of 8)

3.5.1 P305 connector

The P305 is LVDS bus, output to LCD module. The output voltage is 5 voltage.

3.5.2 MCU (Circuit diagrams MAIN PWB 7 of 8)

The I307 MCU is system processor. It can programmed scaler, control power save sequence for the system, input keypad function, output LED, control audio function, and ISP / DDC2Bi function.

3.5.3 X302 crystal

The X302 crystal is 11.0592MHz, support the operated clock to the MCU.

3.5.4 Reset circuit

The C396, R379, D316 is support reset signal to the MCU, then MCU have output hardware reset signal (HWRESET) to the scaler.

3.5.5 I308EEPROM

The I308 is 24LC16 EEPROM, the data transfer between I308 and MCU is effected through the IIC bus SCL (pin14) and SDA (pin13) of MCU. The OSD related setting data, I305 control data and other service data, to be stored in I308.

3.5.6 P308 connector

The P308 has support keypad function. Control is give effect to for the push switch to be used when the user changes the parameters, in order to modify the respective setting values. Whether the switch has been pressed is identified with the switch input level that is turned “L”.

Each switch input port is pulled up at outside of MCU. Related ports of I307 based on Table 1.

Each parameter is stored in the I308 EEPROM, the contents of which are updated as required.

The P308 have LED Green and Amber light, the LED Green signal pin 36 from I307 MCU, and the LED Amber signal pin 37 from I307 MCU.

Table 1 Related ports of I307

Pin No.	I/O	Signal name	Function	Remarks
Pin 3	I	KEY_POWER	Soft power switch input	Power key
Pin 2	I	KEY_MENU	Exit/Enter switch input	Enter / withdraw from OSD
Pin 41	I	KEY_DOWN	↓ switch input	Down key
Pin 42	I	KEY_MINUS	← switch input	- / Mute key
Pin 1	I	KEY_PLUS	→ switch input	+ / Auto key

3.5.7 Audio control function

The I307 MCU output signal control audio mute and power, the pin33 is mute signal, the pin32 is controlled audio power signal.

3.5.8 Scaler programmed function

The I307 MCU is used DDR direct bus, between I305 MST8111B and MCU I307.

3.5.9 ISP and DDC2Bi function

The DDC2Bi is VESA standard for the host PC system, it can through DDC2Bi bus control LCD monitor.

The I309 will off DDC_CLK and DDC_DAT signal, when LCD monitor is no power.

Can use ISP function for firmware modification.

The pin29 is bus clock (DDC_CLK), the pin28 is bus data (DDC_DAT). It is same of the IIC data bus.

3.5.10 The power save sequence function

First disable I307 pin31 (BKLT_EN) from H to L of LCD module back light power, delay some time, then disable I307 pin9 (PANELVCC_EN) from H to L of LCD module power, and disable I307 pin32 (AUDIO_EN) from H to L of audio power, and through 3-wire bus programmed I305 MST8111B to power down mode.

3.6 Audio (Circuit diagrams MAIN PWB 8 of 8) [OPTION]

3.6.1 P309 connector

The audio signal input received from the audio input terminal P309 from the jack input of the jack board, P309 is applied to amplifier I311 of pin4 (L-CH) and pin9 (R-CH) through the low-pass filter consisting of R417, R418, C419 and C420.

3.6.2 P310 connector

The audio signal is output to the audio output terminal P310, and to the internal speaker system.

3.6.3 I310 MOSFET

I310 MOSFET (CEM9435A) is cut audio power (12V) for the power save sequence. The signal (AUDIO_EN) is ON/OFF I310 MOSFET through the Q311 control.

3.6.4 I311 amplifier

The I311 TDA7496L is audio amplifier, I311 operated power voltage is 12V.

I311 pin4 and pin9 is audio input port.

I311 pin14 and pin17 is audio output port.

I311 pin 12 is mute input from I307 MCU. The pin 6 is audio volume from the I305 MST8111B.

4 Others

4.1 Detection of POWER switch status

The MCU identifies the ON status of the two power supplies. The identification is made when the power supply is turn off. For example, if the power supply is turn off with the POWER switch, the POWER switch must be turn on when active the power supply again. If the power supply is turned off by pulling out the power cord, then this power supply can be turned on by connecting the power cord, without pressing the POWER switch.

4.2 Display mode identification

4.2.1 Display mode identification

The display mode of input signal is identified based on Table 2.

When the mode has been identified through the measurement of horizontal and vertical frequencies, the total number of lines is determined with a formula of "Horizontal frequency / Vertical frequency = Total number of number of lines". Final identification can be made by examining the coincidence of the obtained figure with the number of lines for the mode identified from the frequency. The Distinction Hsync and Vsync of each mode is shown in Table 3.

When the detected frequency if the sync signal has changed, the total number of lines should be counted even through it is range identified frequency in the same mode.

4.2.2 Out of range

This out of range mode is assumed when the frequency out of the horizontal / vertical signal is as specified below.

Vertical frequency : 56 ~ 76 Hz.

Horizontal frequency : 30 ~ 81.1KHz.

4.2.3 Power save mode

The power save mode is assumed when the horizontal / vertical signals are as specified below.

If there is no horizontal sync signal input.

If there is no vertical sync signal input.

If the horizontal sync signal is outside the measuring range of MST8111B.

If the vertical sync signal is outside the measuring range of MST8111B.

Table 2 video mode

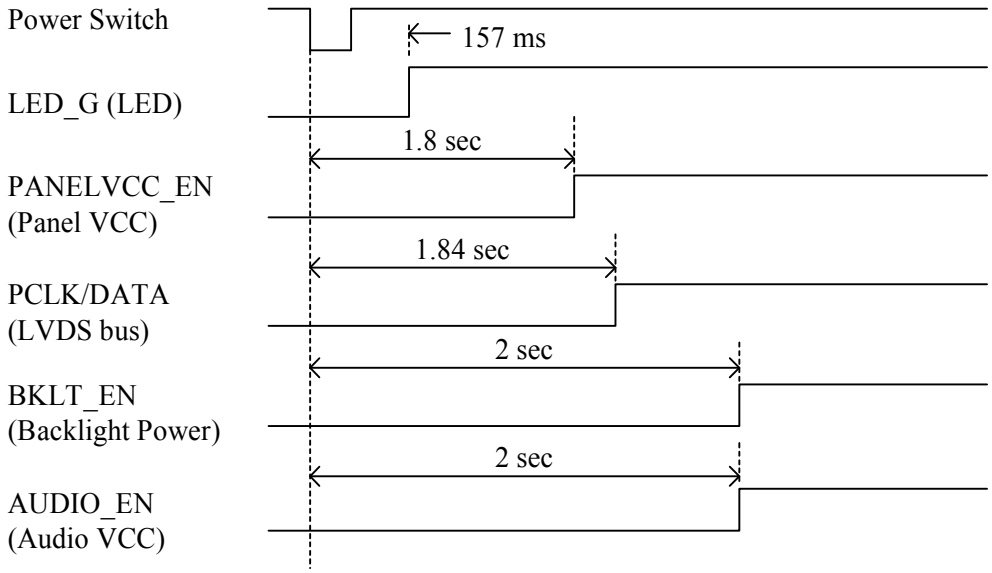
Mode	Resolution	H-Freq (KHz)	Band Width (MHz)	Polarity	
				H	V
1	720x400 (70Hz)	31.469	28.322	-	+
2	640x480 (59.94Hz)	31.469	25.175	-	-
3	640x480 (66.67Hz)	35	30.24	-	-
4	640x480 (72Hz)	37.861	31.5	-	-
5	640x480 (75Hz)	37.5	31.5	-	-
6	800x600 (56.25Hz)	35.156	36	+	+
7	800x600 (60Hz)	37.879	40	+	+
8	800x600 (72Hz)	48.077	50	+	+
9	800x600 (75Hz)	46.875	49.5	+	+
10	832x624 (74.55Hz)	49.722	57.28	-	-
11	1024x768 (60Hz)	48.363	65	-	-
12	1024x768 (70Hz)	56.476	75	-	-
13	1024x768 (75Hz)	60.023	78.75	+	+
14	1152x864 (75Hz)	67.5	108	+	+
15	1280x960 (60Hz)	60	108	+	+
16	1280x1024 (60Hz)	63.981	108	+	+
17	1280x1024 (75Hz)	79.976	135	+	+

Table 3 the Hsync, Vsync distinction

Indication resolution	Distinction Hsync	Distinction Vsync	The fixed mode
720 x 400	30.5KHz≦fH≦32.5KHz	69Hz≦fV≦71Hz	1
640 x 480	30.5KHz≦fH≦32.5KHz	59Hz≦fV≦61Hz	2
	34KHz≦fH≦36KHz	65.7Hz≦fV≦67.7Hz	3
	36.9KHz≦fH≦38.9KHz	71.8Hz≦fV≦73.8Hz	4
	36.5KHz≦fH≦38.5KHz	74Hz≦fV≦76Hz	5
800 x 600	34.2KHz≦fH≦36.2KHz	55.3Hz≦fV≦57.3Hz	6
	36.9KHz≦fH≦38.9KHz	59.3Hz≦fV≦61.3Hz	7
	47.1KHz≦fH≦49.1KHz	71.2Hz≦fV≦73.2Hz	8
	45.9KHz≦fH≦47.9KHz	74Hz≦fV≦76Hz	9
832 x 624	48.7KHz≦fH≦50.7KHz	73.5Hz≦fV≦75.5Hz	10
1024 x 768	47.4KHz≦fH≦49.4KHz	59Hz≦fV≦61Hz	11
	55.5KHz≦fH≦57.5KHz	69Hz≦fV≦71Hz	12
	59KHz≦fH≦61KHz	74Hz≦fV≦76Hz	13
1152 x 864	66.5KHz≦fH≦68.5KHz	74Hz≦fV≦76Hz	14
1280 x 960	59KHz≦fH≦61KHz	59Hz≦fV≦61Hz	15
1280 x 1024	62.9KHz≦fH≦64.9KHz	59Hz≦fV≦61Hz	16
1280 x 1024	79KHz≦fH≦81KHz	74Hz≦fV≦76Hz	17

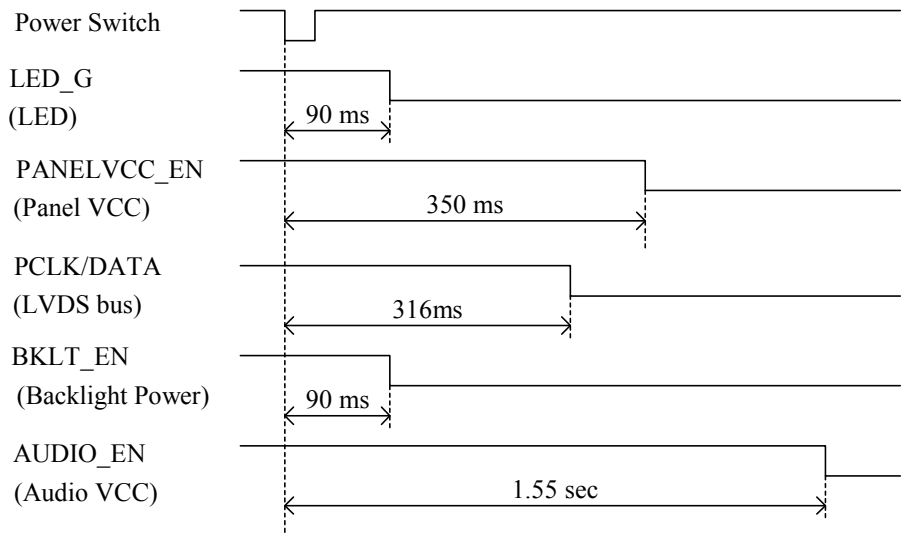
4.3 Power ON sequence

When the POWER switch is pressed, the POWER OFF signal is turned "H". when this "H" potential is detected, the CPU begins to establish the respective power supplies according to the sequence show below.



4.4 Power OFF sequence

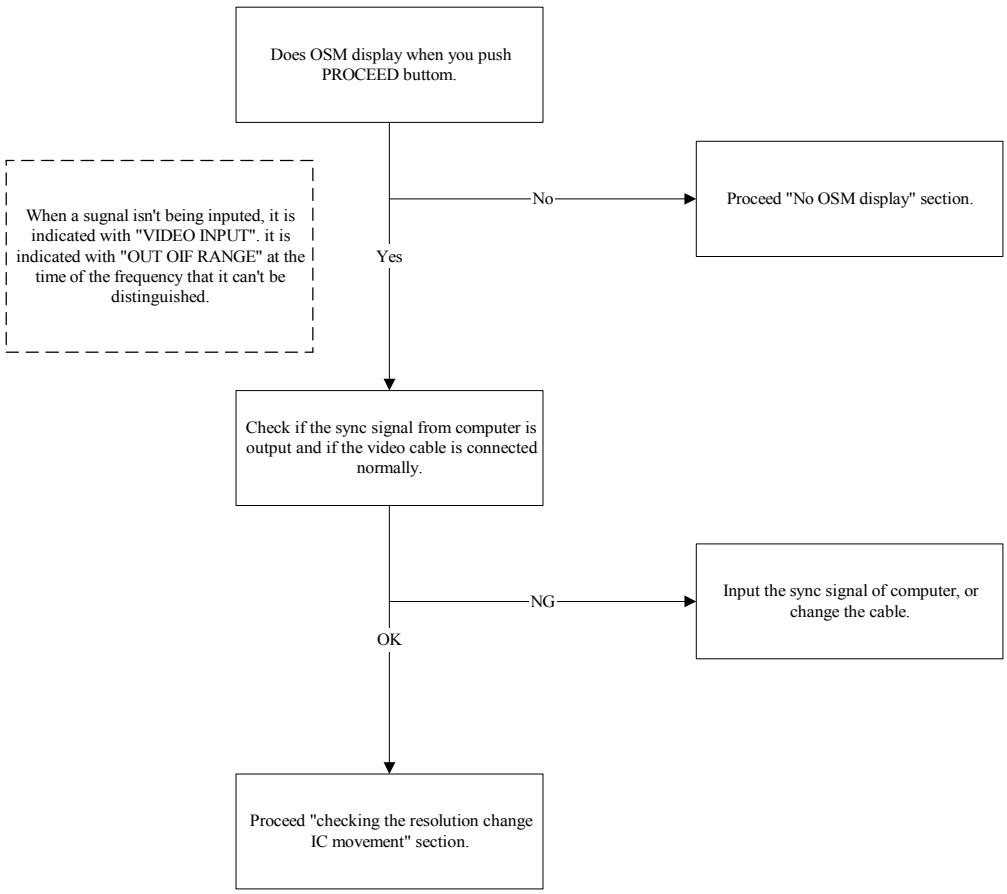
When the POWER switch is pressed, while the power supply is ON, the POWER ON signal is turned"H". when this "H" potential is detected, the CPU begins to turn off the respective power supplies according to sequence show below.



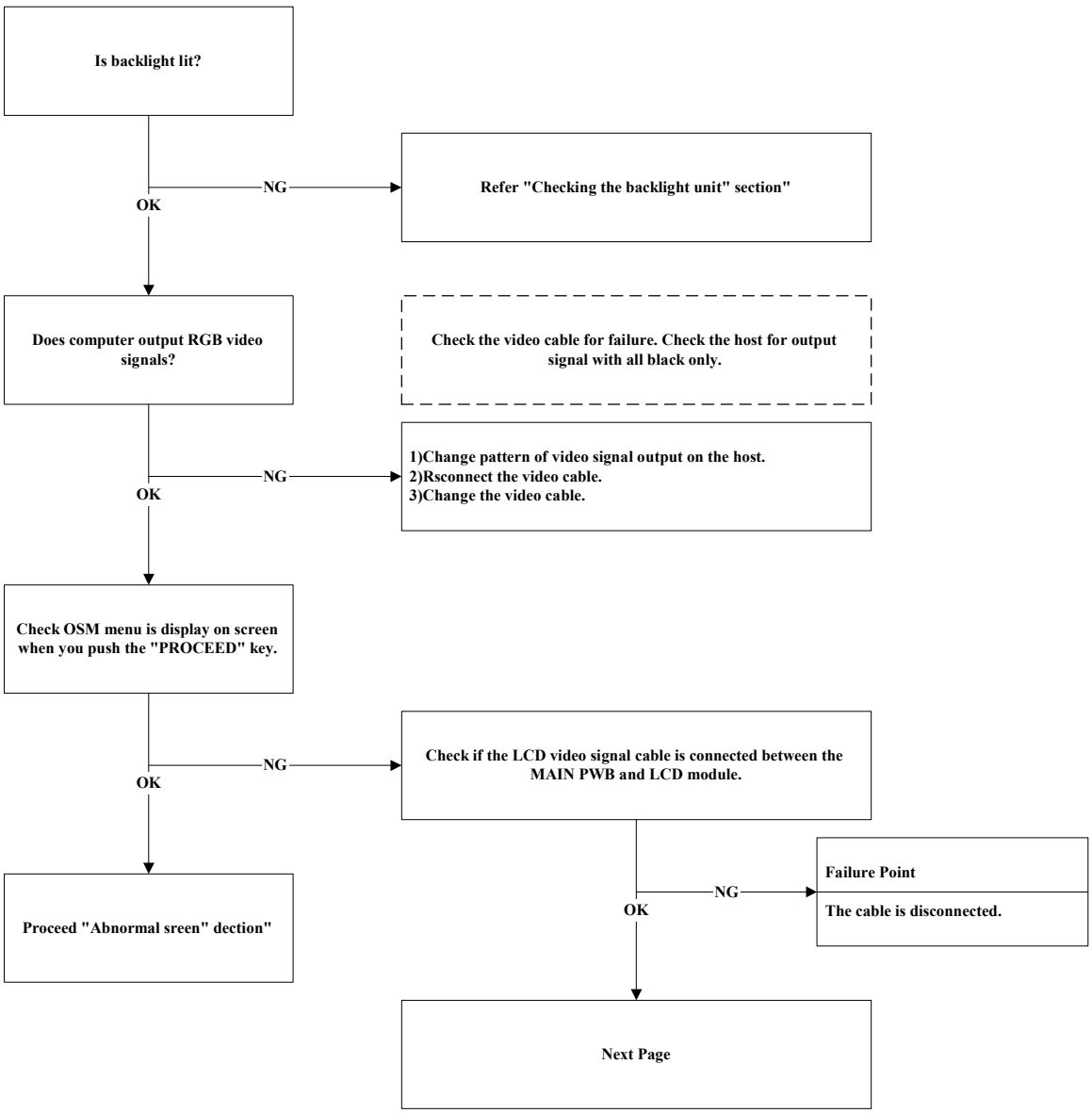
4.5 List of I/O Pin Assignments of the I307

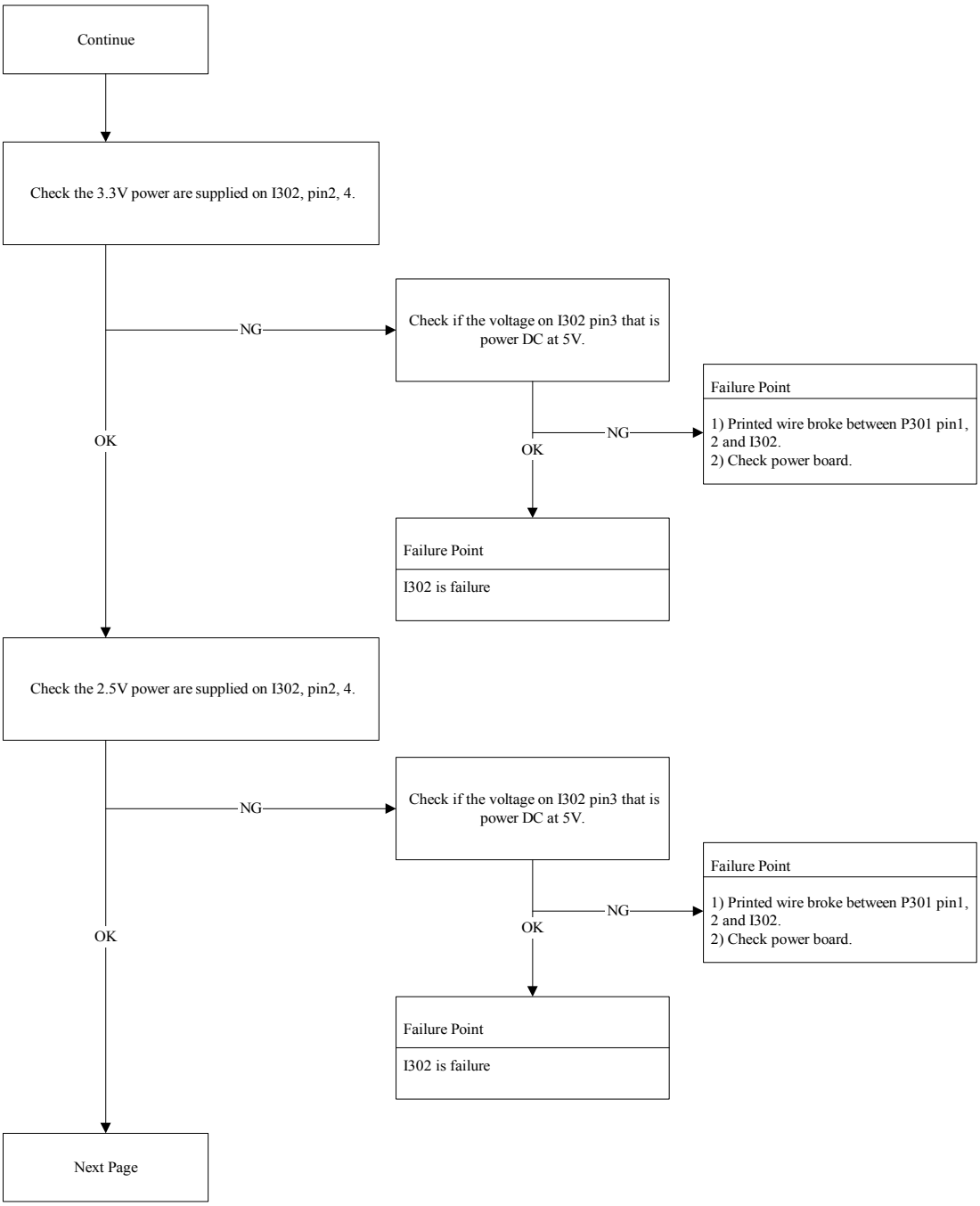
Pin No.	Port	Signal Name	Initial Setting	Function
3	P5.0	KEY_POWER	H	ON/OFF monitor power
2	P5.1	KEY_MENU	H	OSD enter/exit enable
1	P5.2	KEY_PLUS	H	OSD right enable
42	P5.3	KEY_MINUS	H	OSD left enable
41	P5.4	KEY_DOWN	H	OSD down enable
38	P1.0	LED_G	H	LED green enable
37	P1.1	LED_A	H	LED amber enable
20	P1.2	SCL	H	Clock of 3-wire bus for scaler
21	P1.3	SDA	H	Data of 3-wire bus for scaler
22	P1.4	CSZ	H	Chip select of 3-wire bus for scaler
25	P1.5	HWRESET	H	Reset enable to scaler
29	P3.0	RXD	H	UART interface data IN
28	P3.1	TXD	H	UART interface data OUT
19	P3.2	INT	H	Interrupt signal from the scaler
13	P3.4	ISDA	H	EEPROM data bus
14	P3.5	ISCL	H	EEPROM clock bus
27	P6.0	DDC_WP	L	DDC EEPROM write protection
26	P6.1	VGA_DET	H	VGA cable connected
9	P6.3	PANELVCC_EN	L	Panel power enable
31	P6.5	BKLT_EN	L	Back light power enable
32	P6.6	AUDIO_EN	L	Audio power enable
33	P6.7	MUTE	L	Audio mute enable
Note : Other I/O pin assignments of the I305 MST8111B				
73	PWM0	BKLT_ADJ	-	Backlight brightness control
74	PWM1	VOLUME	-	Audio volume control

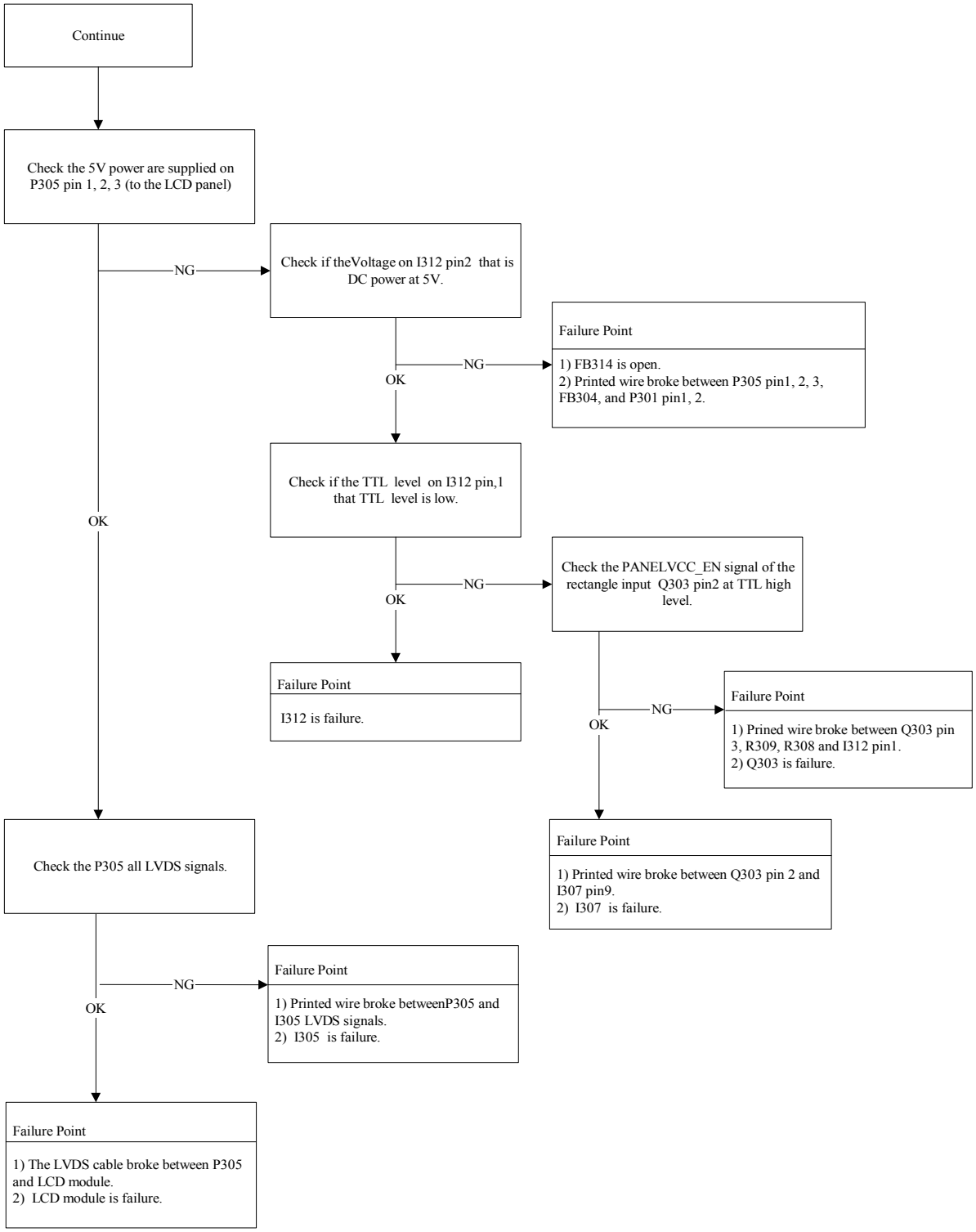
1. No display of screen (Screen is black, color of LED is amber)


Does OSM display when you push PROCEED buttom.
No
Proceed "No OSM display" section.
When a sugnal isn't being inputed, it is indicated with "VIDEO INPUT". it is indicated with "OUT OIF RANGE" at the time of the frequency that it can't be distinguished.
Yes
Check if the sync signal from computer is output and if the video cable is connected normally.
NG
Input the sync signal of computer, or change the cable.
OK
Proceed "checking the resolution change IC movement" section.

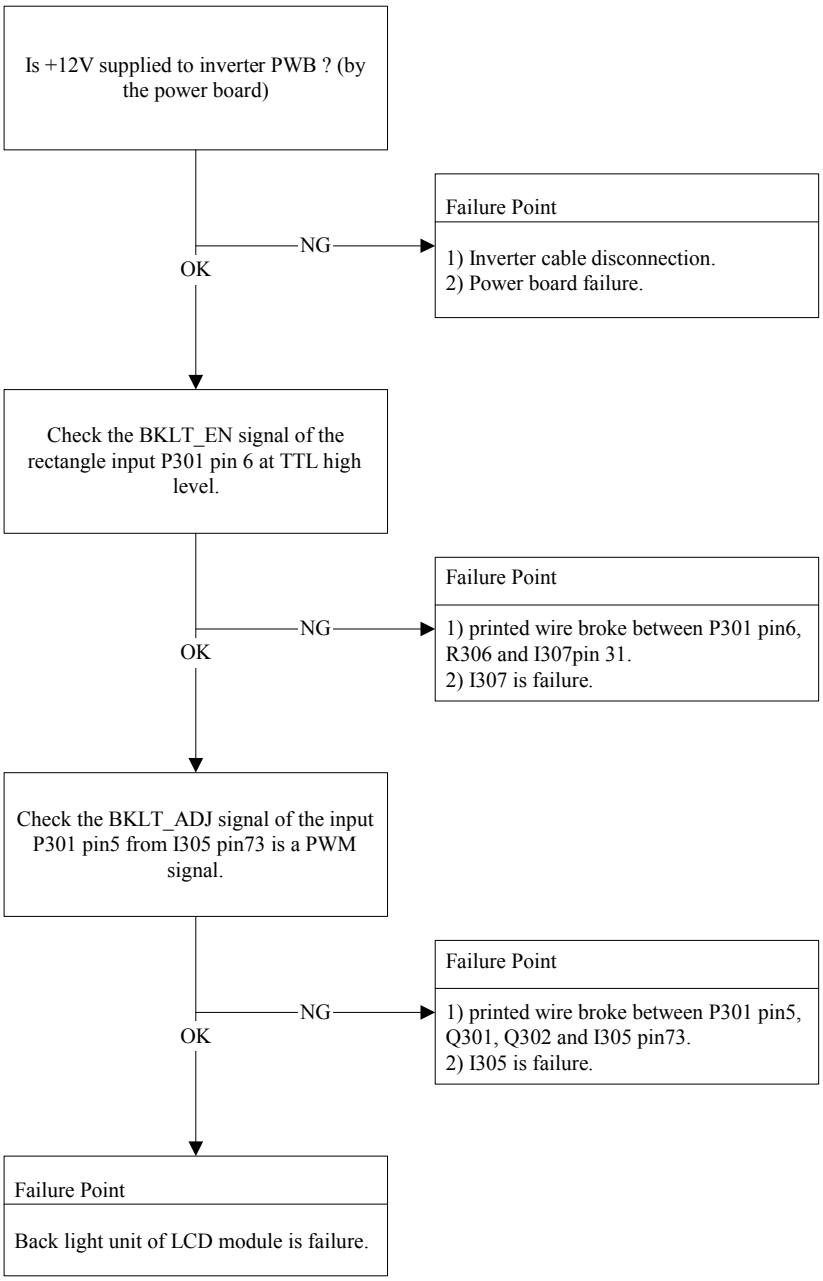
2. Nothing displays on screen (Screen is black, color of LED is green)


Is backlight lit?
NG
Refer "Checking the backlight unit" section"
OK
Does computer output RGB video signals?
Check the video cable for failure. Check the host for output signal with all black only.
NG
1)Change pattern of video signal output on the host.
2)Rsconnect the video cable.
3)Change the video cable.
OK
Check OSM menu is display on screen when you push the "PROCEED" key.
NG
Check if the LCD video signal cable is connected between the MAIN PWB and LCD module.
OK
Failure Point
NG
The cable is disconnected.
OK
Proceed "Abnormal sreen" dection"
Next Page

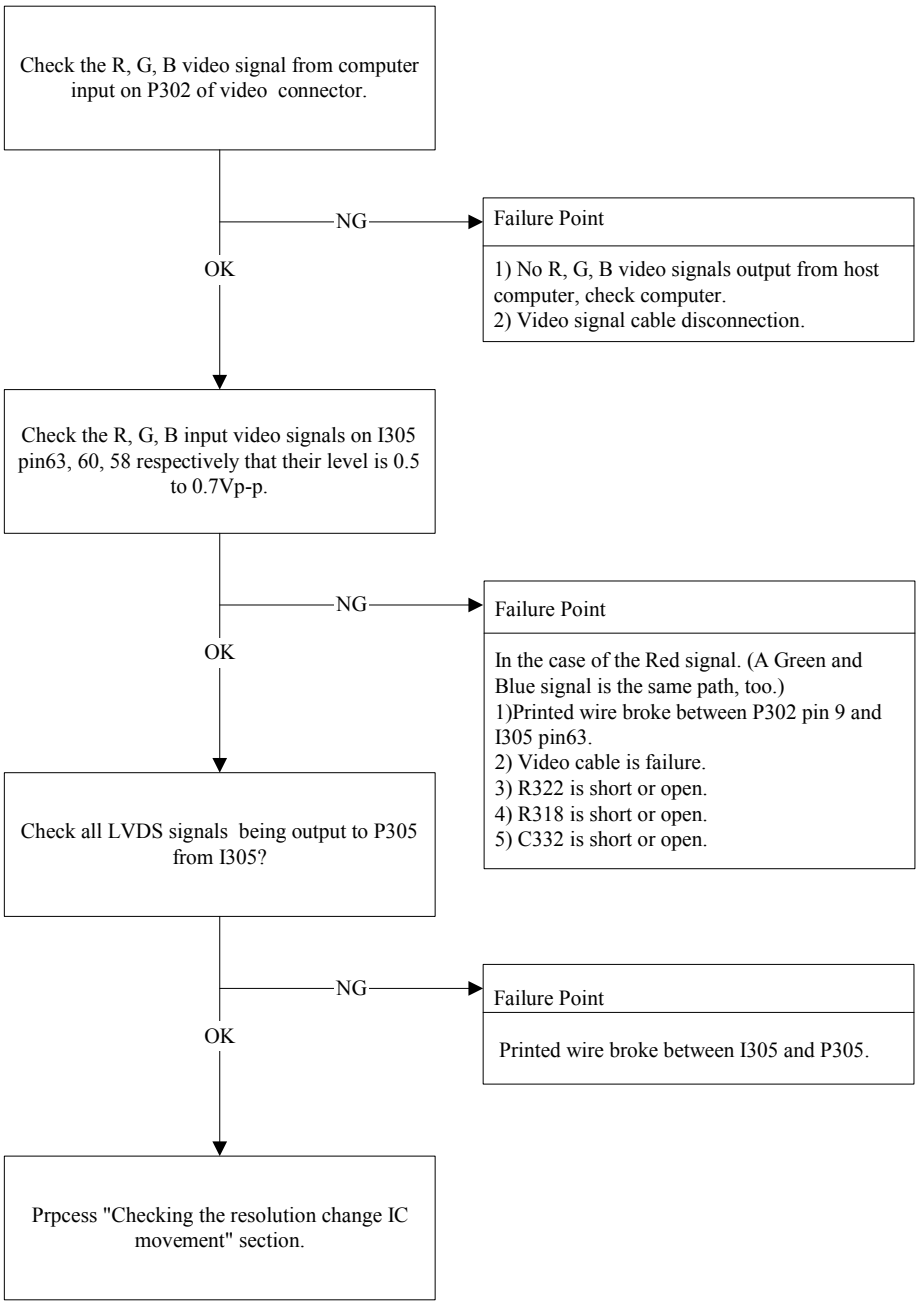

Continue
Check the 3.3V power are supplied on I302, pin2, 4.
NG
Check if the voltage on I302 pin3 that is power DC at 5V.
Failure Point
1) Printed wire broke between P301 pin1, 2 and I302.
2) Check power board.
NG
OK
OK
Failure Point
I302 is failure
Check the 2.5V power are supplied on I302, pin2, 4.
NG
Check if the voltage on I302 pin3 that is power DC at 5V.
Failure Point
1) Printed wire broke between P301 pin1, 2 and I302.
2) Check power board.
NG
OK
OK
Failure Point
I302 is failure
Next Page


Continue
Check the 5V power are supplied on P305 pin 1, 2, 3 (to the LCD panel)
NG
Check if theVoltage on I312 pin2 that is DC power at 5V.
NG
Failure Point
1) FB314 is open.
2) Printed wire broke between P305 pin1, 2, 3, FB304, and P301 pin1, 2.
OK
Check if the TTL level on I312 pin,1 that TTL level is low.
OK
NG
Check the PANELVCC_EN signal of the rectangle input Q303 pin2 at TTL high level.
Failure Point
I312 is failure.
OK
NG
Failure Point
1) Prined wire broke between Q303 pin 3, R309, R308 and I312 pin1.
2) Q303 is failure.
Failure Point
1) Printed wire broke between Q303 pin 2 and I307 pin9.
2) I307 is failure.
Check the P305 all LVDS signals.
NG
Failure Point
1) Printed wire broke betweenP305 and I305 LVDS signals.
2) I305 is failure.
OK
Failure Point
1) The LVDS cable broke between P305 and LCD module.
2) LCD module is failure.

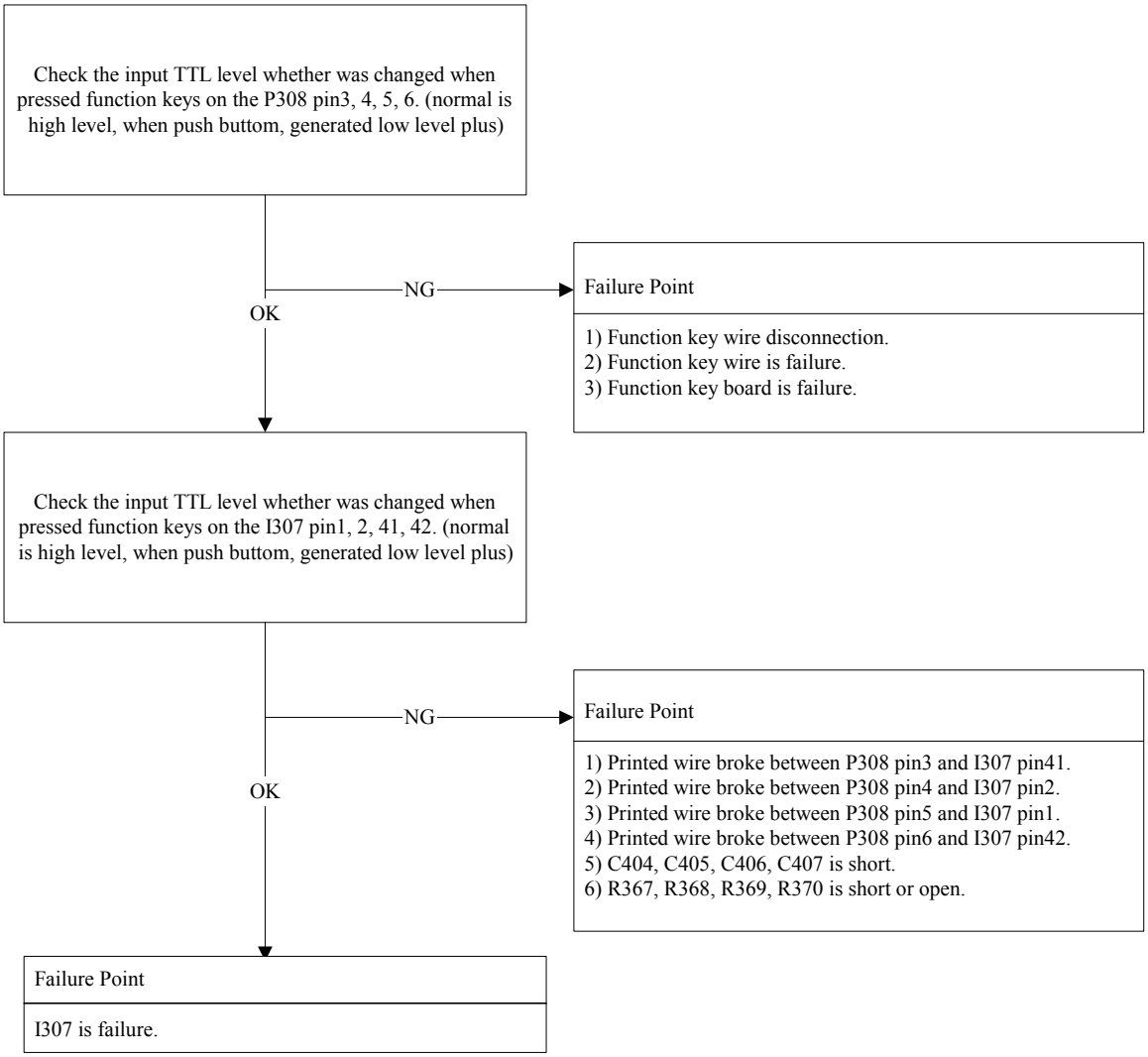
3. Checking the back light unit


Is +12V supplied to inverter PWB ? (by the power board)
NG
Failure Point
1) Inverter cable disconnection.
2) Power board failure.
OK
Check the BKLT_EN signal of the rectangle input P301 pin 6 at TTL high level.
NG
Failure Point
1) printed wire broke between P301 pin6, R306 and I307pin 31.
2) I307 is failure.
OK
Check the BKLT_ADJ signal of the input P301 pin5 from I305 pin73 is a PWM signal.
NG
Failure Point
1) printed wire broke between P301 pin5, Q301, Q302 and I305 pin73.
2) I305 is failure.
OK
Failure Point
Back light unit of LCD module is failure.

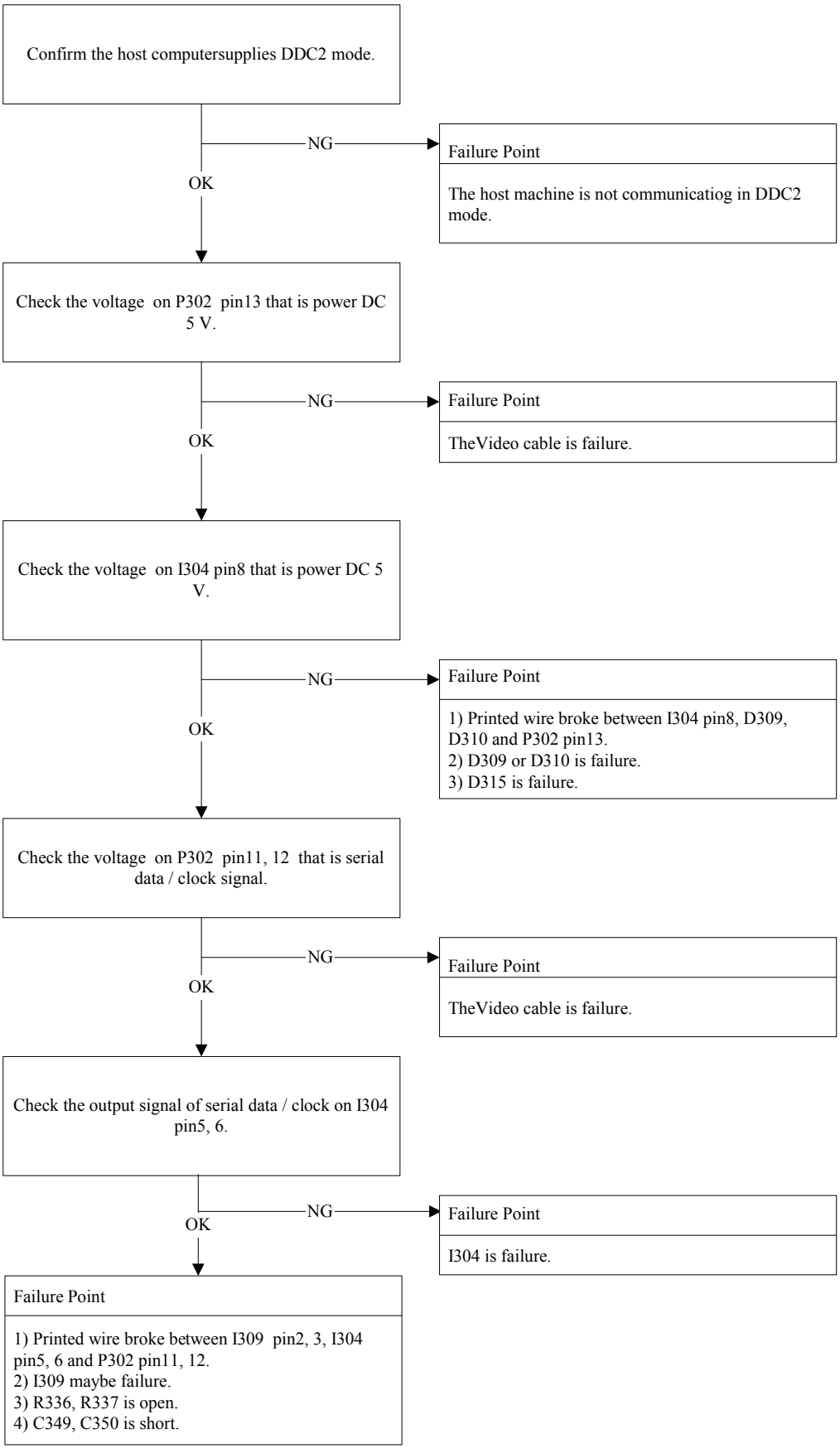
4. Abnormal screen


Check the R, G, B video signal from computer input on P302 of video connector.
NG
Failure Point
1) No R, G, B video signals output from host computer, check computer.
2) Video signal cable disconnection.
OK
Check the R, G, B input video signals on I305 pin63, 60, 58 respectively that their level is 0.5 to 0.7Vp-p.
NG
Failure Point
In the case of the Red signal. (A Green and Blue signal is the same path, too.)
1)Printed wire broke between P302 pin 9 and I305 pin63.
2) Video cable is failure.
3) R322 is short or open.
4) R318 is short or open.
5) C332 is short or open.
OK
Check all LVDS signals being output to P305 from I305?
NG
Failure Point
Printed wire broke between I305 and P305.
OK
Prpcess "Checking the resolution change IC movement" section.

5. Abnormal OSM display adjust problem

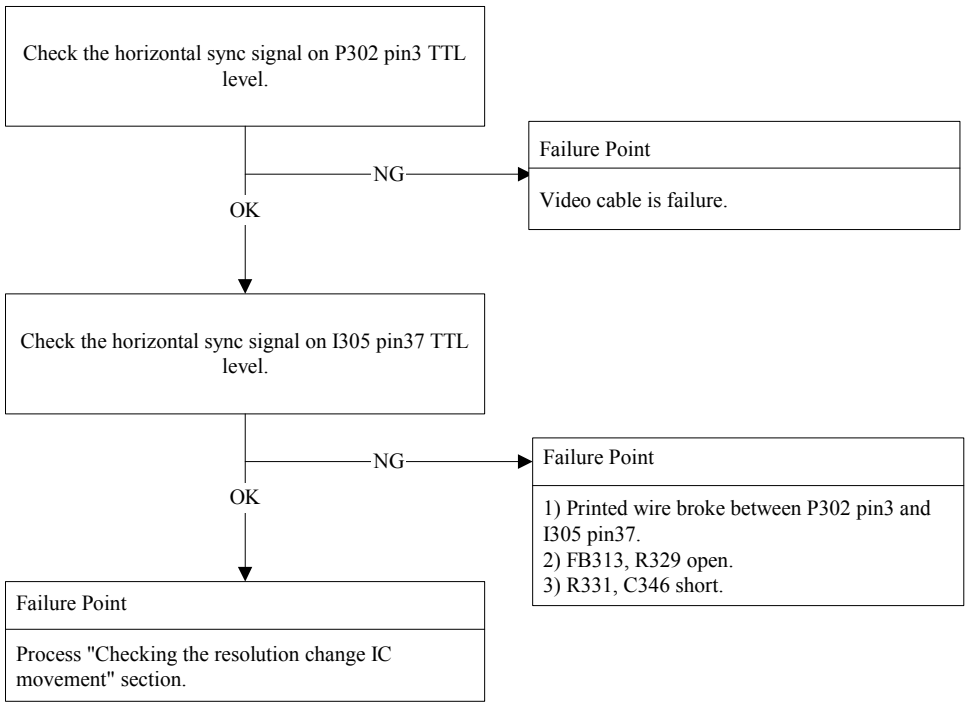

Check the input TTL level whether was changed when pressed function keys on the P308 pin3, 4, 5, 6. (normal is high level, when push buttom, generated low level plus)
NG
Failure Point
1) Function key wire disconnection.
2) Function key wire is failure.
3) Function key board is failure.
OK
Check the input TTL level whether was changed when pressed function keys on the I307 pin1, 2, 41, 42. (normal is high level, when push buttom, generated low level plus)
NG
Failure Point
1) Printed wire broke between P308 pin3 and I307 pin41.
2) Printed wire broke between P308 pin4 and I307 pin2.
3) Printed wire broke between P308 pin5 and I307 pin1.
4) Printed wire broke between P308 pin6 and I307 pin42.
5) C404, C405, C406, C407 is short.
6) R367, R368, R369, R370 is short or open.
OK
Failure Point
I307 is failure.

6. Abnormal plug and play operation

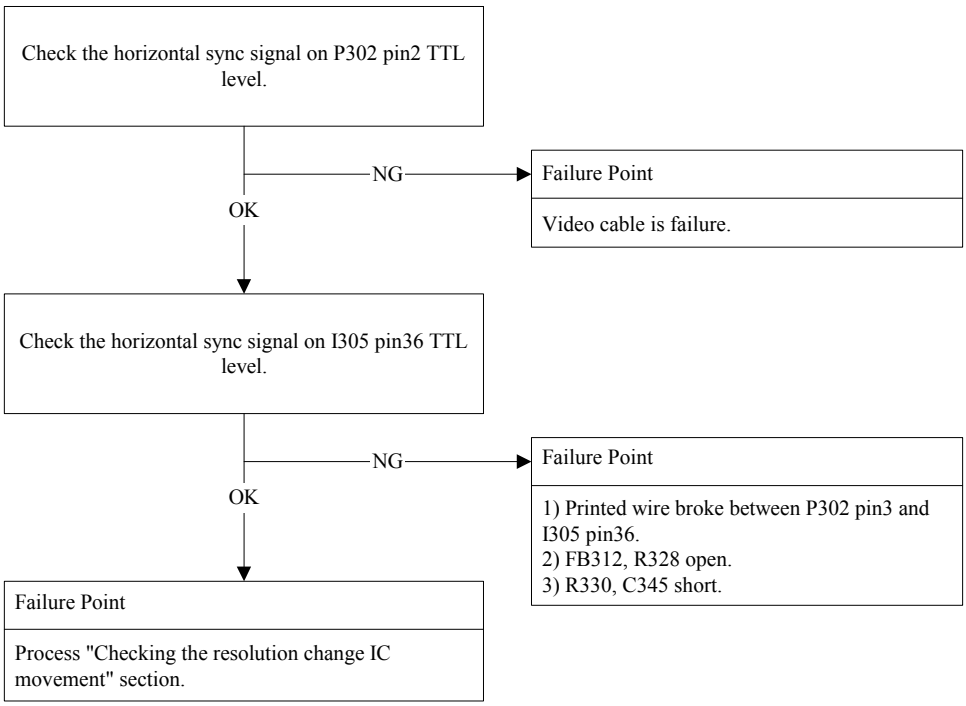

Confirm the host computersupplies DDC2 mode.
NG
Failure Point
The host machine is not communicatiog in DDC2 mode.
OK
Check the voltage on P302 pin13 that is power DC 5 V.
NG
Failure Point
TheVideo cable is failure.
OK
Check the voltage on I304 pin8 that is power DC 5 V.
NG
Failure Point
1) Printed wire broke between I304 pin8, D309, D310 and P302 pin13.
2) D309 or D310 is failure.
3) D315 is failure.
OK
Check the voltage on P302 pin11, 12 that is serial data / clock signal.
NG
Failure Point
TheVideo cable is failure.
OK
Check the output signal of serial data / clock on I304 pin5, 6.
NG
Failure Point
I304 is failure.
OK
Failure Point
1) Printed wire broke between I309 pin2, 3, I304 pin5, 6 and P302 pin11, 12.
2) I309 maybe failure.
3) R336, R337 is open.
4) C349, C350 is short.

7. Checking the interface circuit of sync signal

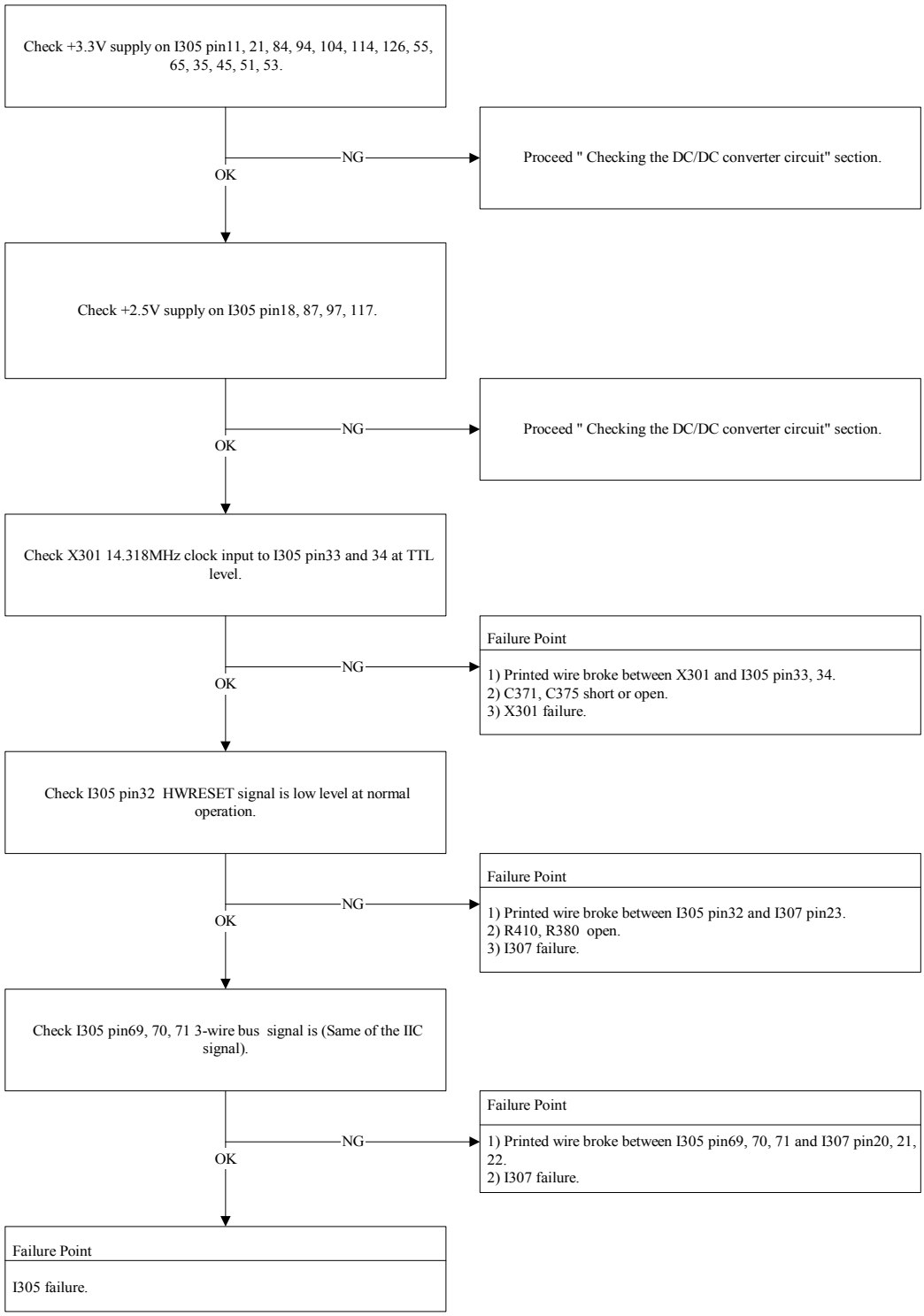
7.1 Checking the control circuit of horizontal sync pluse


Check the horizontal sync signal on P302 pin3 TTL level.
NG
Failure Point
Video cable is failure.
OK
Check the horizontal sync signal on I305 pin37 TTL level.
NG
Failure Point
1) Printed wire broke between P302 pin3 and I305 pin37.
2) FB313, R329 open.
3) R331, C346 short.
OK
Failure Point
Process "Checking the resolution change IC movement" section.

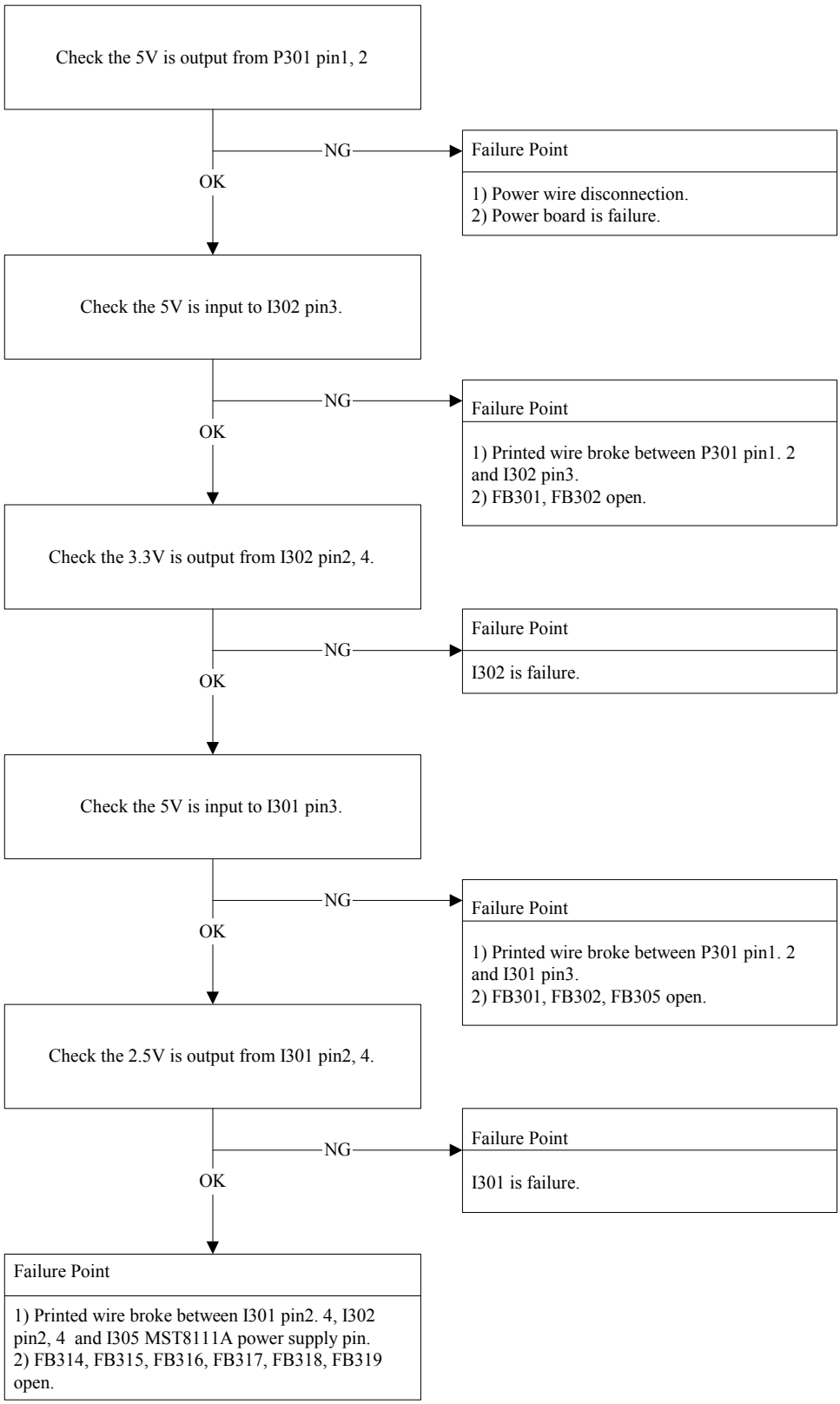
7.2 Checking the control circuit of vertical sync pluse


Check the horizontal sync signal on P302 pin2 TTL level.
NG
Failure Point
Video cable is failure.
OK
Check the horizontal sync signal on I305 pin36 TTL level.
NG
Failure Point
1) Printed wire broke between P302 pin3 and I305 pin36.
2) FB312, R328 open.
3) R330, C345 short.
OK
Failure Point
Process "Checking the resolution change IC movement" section.

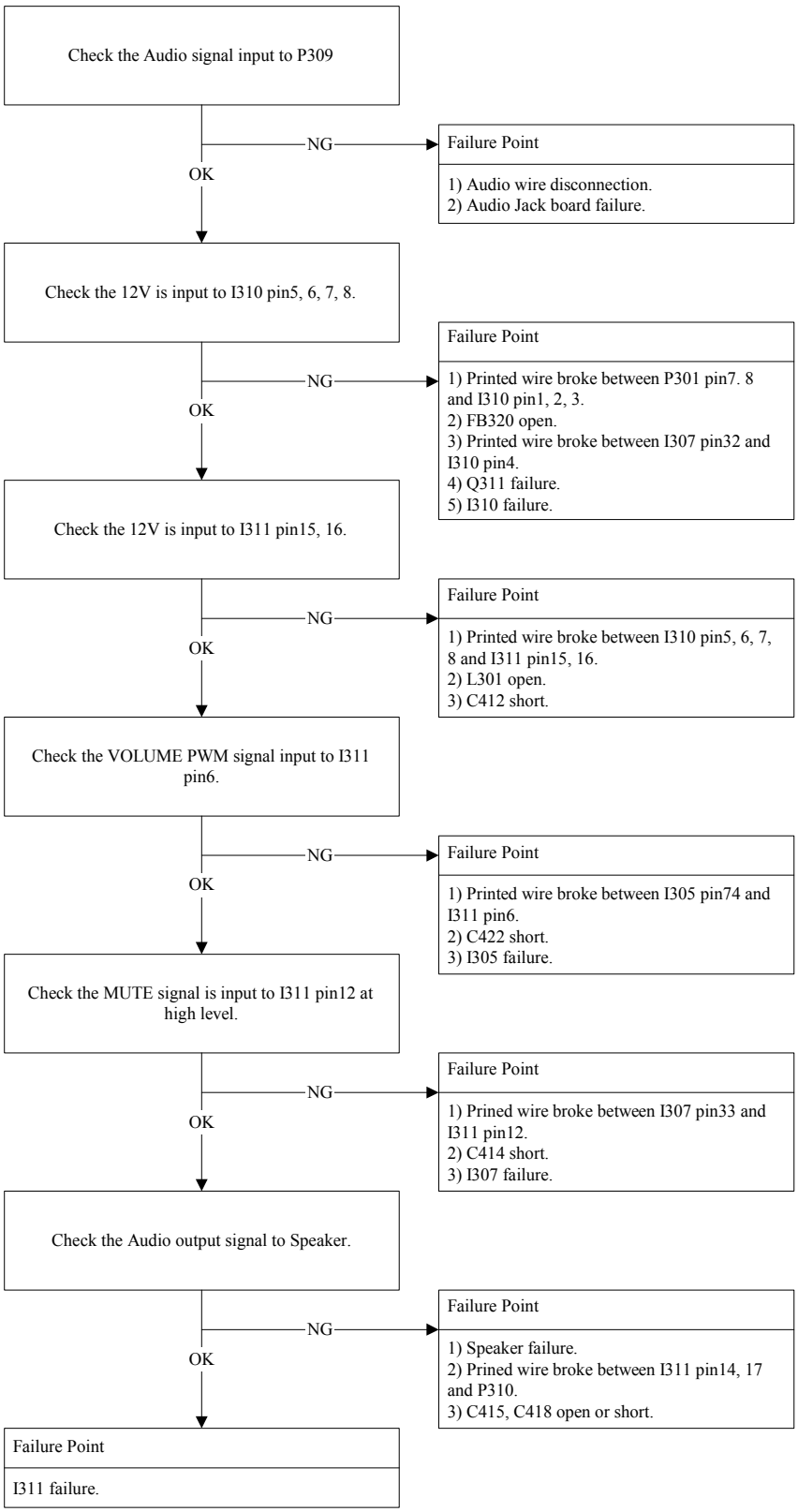
8. Checking the resolution change IC movement


Check +3.3V supply on I305 pin11, 21, 84, 94, 104, 114, 126, 55, 65, 35, 45, 51, 53.
NG
Proceed " Checking the DC/DC converter circuit" section.
OK
Check +2.5V supply on I305 pin18, 87, 97, 117.
NG
Proceed " Checking the DC/DC converter circuit" section.
OK
Check X301 14.318MHz clock input to I305 pin33 and 34 at TTL level.
Failure Point
NG
1) Printed wire broke between X301 and I305 pin33, 34.
2) C371, C375 short or open.
3) X301 failure.
OK
Check I305 pin32 HWRESET signal is low level at normal operation.
Failure Point
NG
1) Printed wire broke between I305 pin32 and I307 pin23.
2) R410, R380 open.
3) I307 failure.
OK
Check I305 pin69, 70, 71 3-wire bus signal is (Same of the IIC signal).
Failure Point
NG
1) Printed wire broke between I305 pin69, 70, 71 and I307 pin20, 21, 22.
2) I307 failure.
OK
Failure Point
I305 failure.

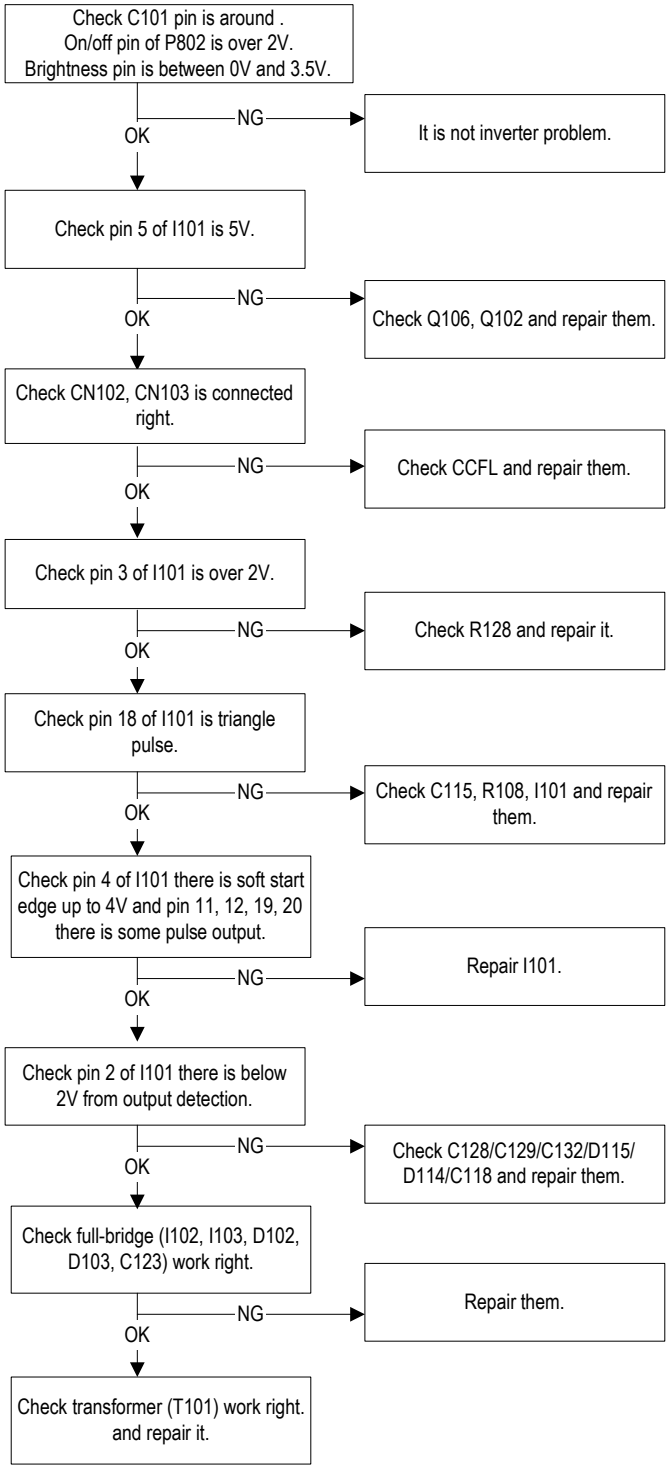
9. Checking the DC/DC converter circuit


Check the 5V is output from P301 pin1, 2
NG
Failure Point
1) Power wire disconnection.
2) Power board is failure.
OK
Check the 5V is input to I302 pin3.
NG
Failure Point
1) Printed wire broke between P301 pin1. 2 and I302 pin3.
2) FB301, FB302 open.
OK
Check the 3.3V is output from I302 pin2, 4.
NG
Failure Point
I302 is failure.
OK
Check the 5V is input to I301 pin3.
NG
Failure Point
1) Printed wire broke between P301 pin1. 2 and I301 pin3.
2) FB301, FB302, FB305 open.
OK
Check the 2.5V is output from I301 pin2, 4.
NG
Failure Point
I301 is failure.
OK
Failure Point
1) Printed wire broke between I301 pin2. 4, I302 pin2, 4 and I305 MST8111A power supply pin.
2) FB314, FB315, FB316, FB317, FB318, FB319 open.

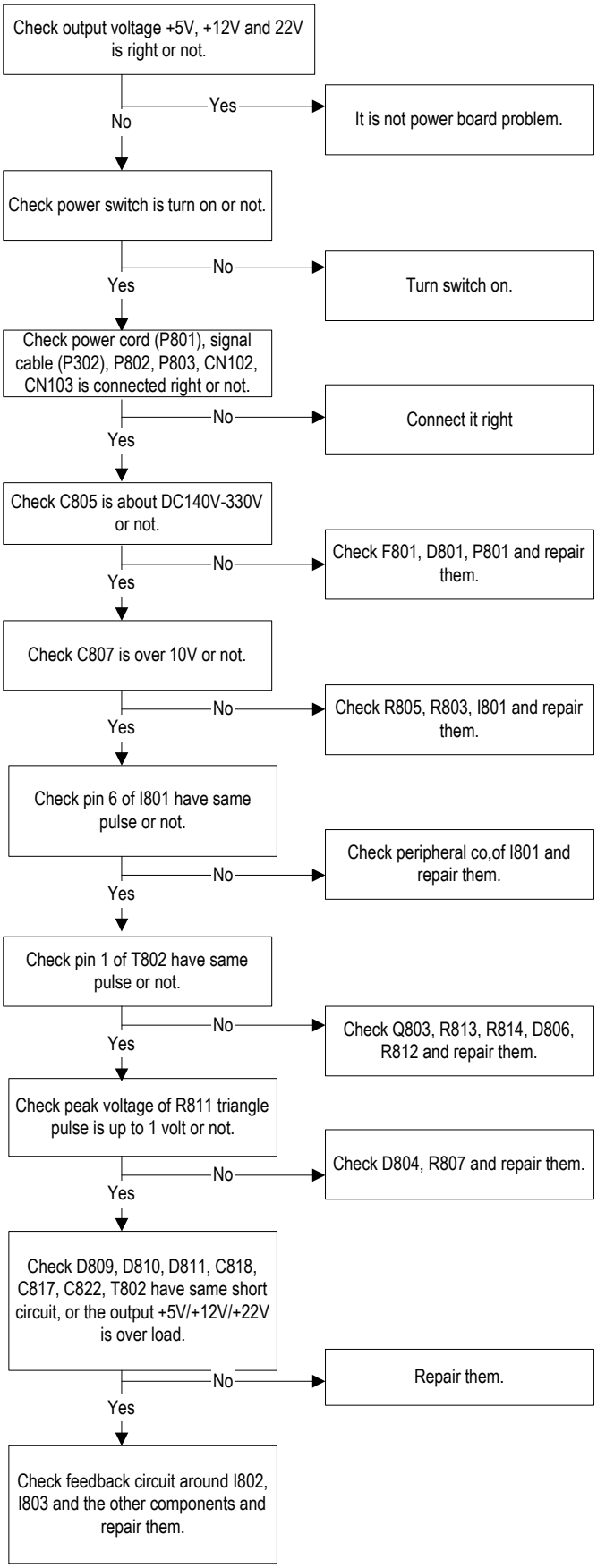
10. Checking the Audio circuit [OPTION]


Check the Audio signal input to P309
NG
Failure Point
1) Audio wire disconnection.
2) Audio Jack board failure.
OK
Check the 12V is input to I310 pin5, 6, 7, 8.
NG
Failure Point
1) Printed wire broke between P301 pin7. 8 and I310 pin1, 2, 3.
2) FB320 open.
3) Printed wire broke between I307 pin32 and I310 pin4.
4) Q311 failure.
5) I310 failure.
OK
Check the 12V is input to I311 pin15, 16.
NG
Failure Point
1) Printed wire broke between I310 pin5, 6, 7, 8 and I311 pin15, 16.
2) L301 open.
3) C412 short.
OK
Check the VOLUME PWM signal input to I311 pin6.
NG
Failure Point
1) Printed wire broke between I305 pin74 and I311 pin6.
2) C422 short.
3) I305 failure.
OK
Check the MUTE signal is input to I311 pin12 at high level.
NG
Failure Point
1) Prined wire broke between I307 pin33 and I311 pin12.
2) C414 short.
3) I307 failure.
OK
Check the Audio output signal to Speaker.
NG
Failure Point
1) Speaker failure.
2) Prined wire broke between I311 pin14, 17 and P310.
3) C415, C418 open or short.
OK
Failure Point
I311 failure.

11. Checking inverter board circuit


Check C101 pin is around .
On/off pin of P802 is over 2V.
Brightness pin is between 0V and 3.5V.
NG
It is not inverter problem.
OK
Check pin 5 of I101 is 5V.
NG
Check Q106, Q102 and repair them.
OK
Check CN102, CN103 is connected right.
NG
Check CCFL and repair them.
OK
Check pin 3 of I101 is over 2V.
NG
Check R128 and repair it.
OK
Check pin 18 of I101 is triangle pulse.
NG
Check C115, R108, I101 and repair them.
OK
Check pin 4 of I101 there is soft start edge up to 4V and pin 11, 12, 19, 20 there is some pulse output.
NG
Repair I101.
OK
Check pin 2 of I101 there is below 2V from output detection.
NG
Check C128/C129/C132/D115/ D114/C118 and repair them.
OK
Check full-bridge (I102, I103, D102, D103, C123) work right.
NG
Repair them.
OK
Check transformer (T101) work right. and repair it.

12. Power Board


Check output voltage +5V, +12V and 22V is right or not.
Yes
It is not power board problem.
No
Check power switch is turn on or not.
No
Turn switch on.
Yes
Check power cord (P801), signal cable (P302), P802, P803, CN102, CN103 is connected right or not.
No
Connect it right
Yes
Check C805 is about DC140V-330V or not.
No
Check F801, D801, P801 and repair them.
Yes
Check C807 is over 10V or not.
No
Check R805, R803, I801 and repair them.
Yes
Check pin 6 of I801 have same pulse or not.
No
Check peripheral co,of I801 and repair them.
Yes
Check pin 1 of T802 have same pulse or not.
No
Check Q803, R813, R814, D806, R812 and repair them.
Yes
Check peak voltage of R811 triangle pulse is up to 1 volt or not.
No
Check D804, R807 and repair them.
Yes
Check D809, D810, D811, C818, C817, C822, T802 have same short circuit, or the output +5V/+12V/+22V is over load.
No
Repair them.
Yes
Check feedback circuit around I802, I803 and the other components and repair them.

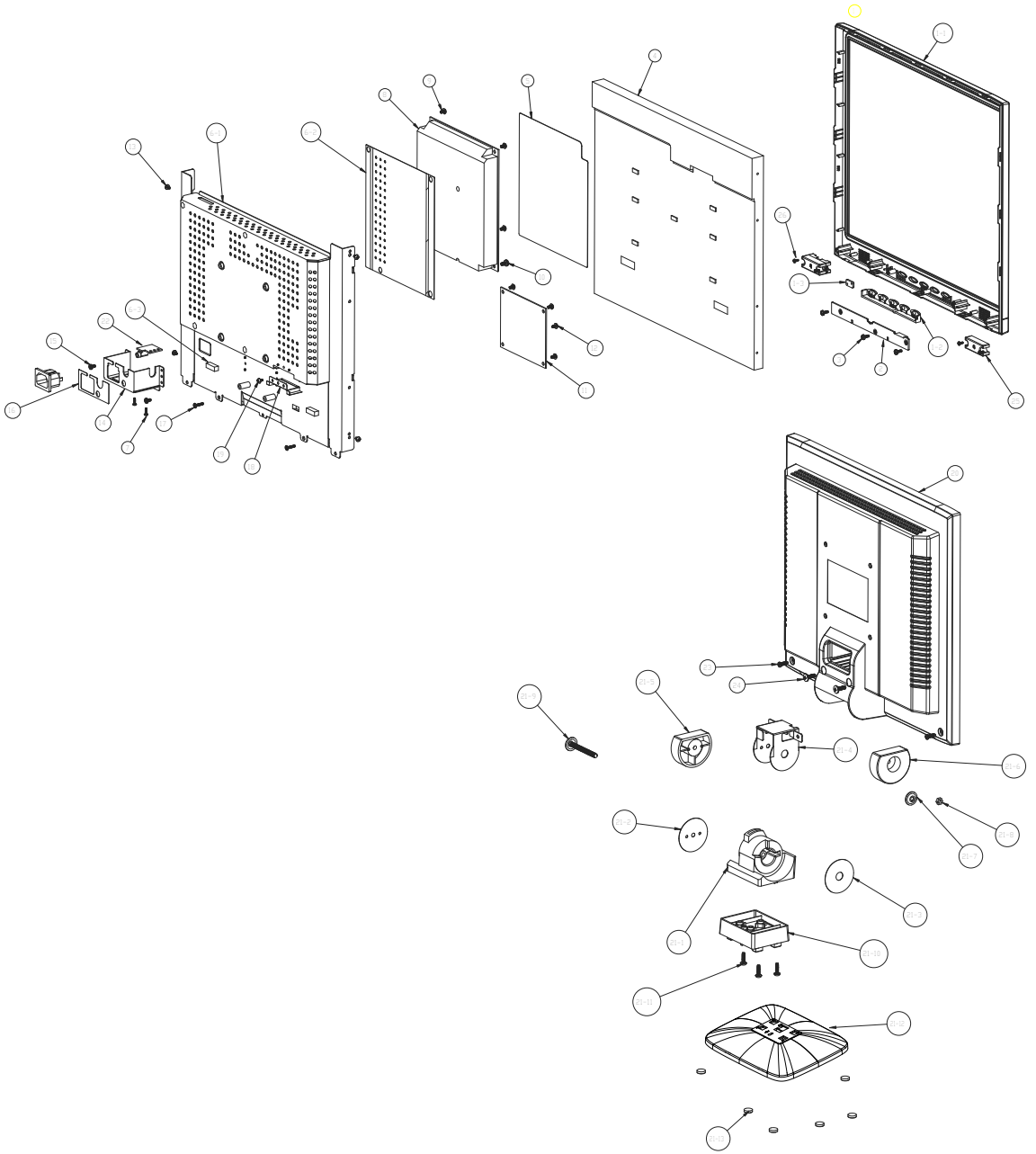
3. Recommended Parts List

Note: 1. If you have spare parts need, please check BOM to get the last release part number and related information.

No.	Location	Part Number	Description
1	I301	6442036518	IC Linear AIC 1117-25CETR TO-252
2	I302	6442023326	IC Linear AIC 1084-33CM TO-263
3	I304	6448018208	IC 24LC02B SOP-8 MICROCHIP
4	I304	6448018218	IC M24C02 SOP-8 ST
5	I305	6444015206	IC MST8111B QFPQ-128 Mstar
6	I308	6448016508	IC 24LC16B SOP-8 MICROCHIP
7	I308	6448016518	IC M24C26 SOP-8 ST
8	I312	6444014708	FET P-Channel AO3401 SOT-23 AOS
9	I307	6448015578	IC MTV312MV64-AJ PLCC44 Myson
10	X301	6449006400	Crystal 14.318MHz AT-49 TOPICS
11	X302	6449004820	Crystal 11.0592MHz AT-49 TOPICS
12	I311	6442023100	IC Amplifier TDA7496L PDIP20 ST
13	L301	6111456131	Coil Choke 45uH DRWW 10x10

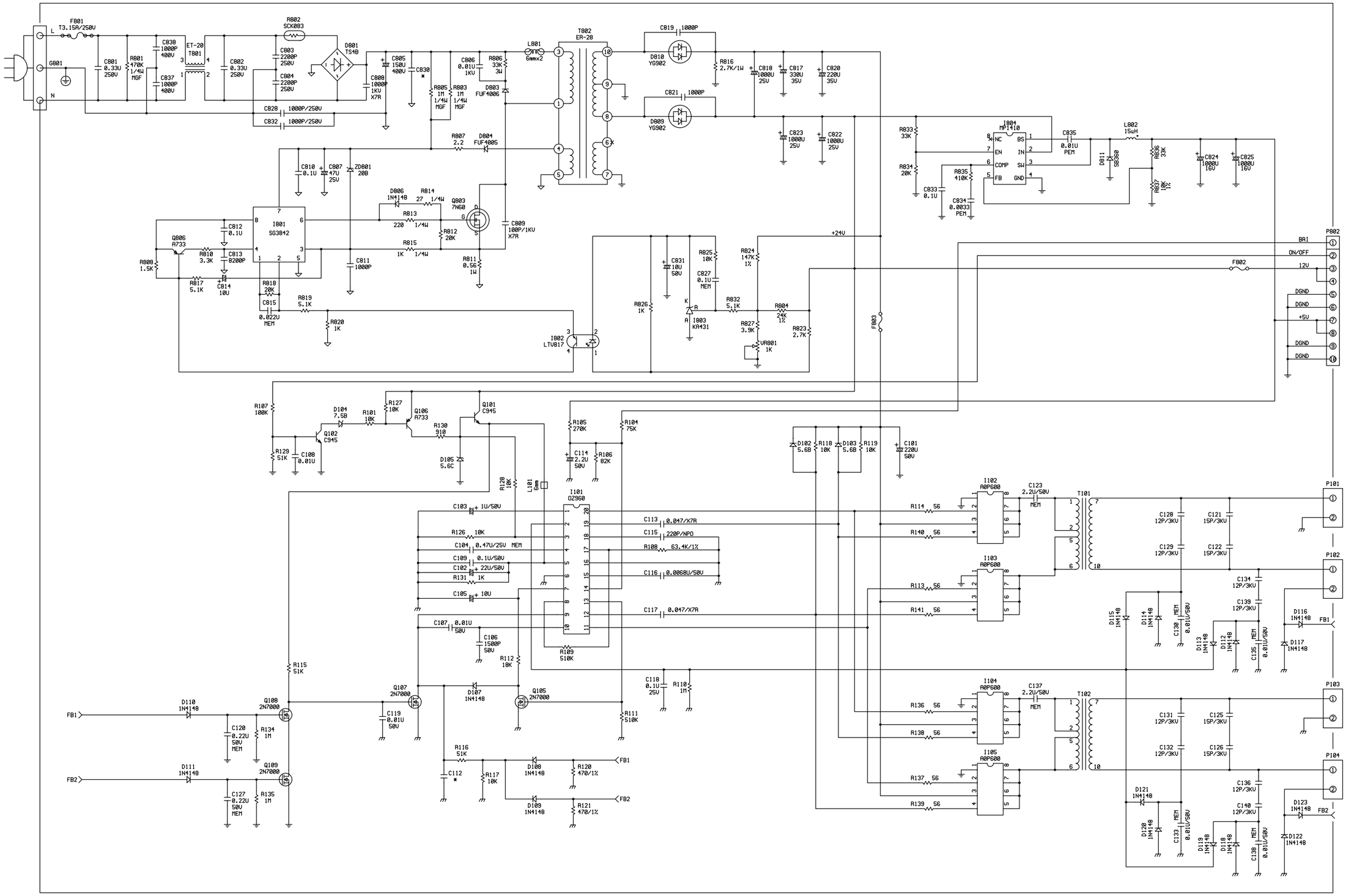
LITEON

AUTH	ZONE	LTR	ECN	DESCRIPTION	DATE	APPROVED
Carol		A	—	RELEASE FOR PRELIMINARY		



ITEM	SUB-ITEM	PART NO.	DESCRIPTION	QTY
1		7737510250-0A	F/C ASSY	1
	1-1	7742254850-0A	FRONT COVER	1
	1-2	7742806820-0A	PUSH BUTTON	1
	1-3	7742250730-0A	LENS	1
2		5117800138	PUSH BUTTON BD	1
3		7140130081	SCREW M3x8L(BUTTON-BD)	3
4		6814701400	CBI PANEL	1
5		7746581720-0A	BARRIER-BOTTOM	1
6		7737857450-0A	CBI-CHASSIS ASSY	1
	6-1	7746708640-0A	CBI CHASSIS BK	1
	6-2	7746581550-0A	BARRIER TOP	1
	6-3	7742202521-0A	RUBBER	2
7		7111220061-0A	SCREW M3x6(F/F BD)	2
8		5114300027	POWER BD	1
9		7111220061-0A	SCREW M3x6(PW BD)	2
10		7116240181-0A	SCREW M4x8(PW BD)	1
11		5113300481	INTERFACE BD	1
12		7111220061-0A	SCREW M3x6(I/F BD)	4
13		7110430061	SCREW M3x5(PANEL)	4
14		7748758650-0A	AC SUPPORT	1
15		7130430061	SCREW M3x6(AC BK)	2
16		7742404580-0A	LOGO-TYPE	1
17		7140230122-0A	SCREW M4x12(CHASSIS-F/C)	2
18		7746203473-0A	SHIELD	1
19		7110430051	SCREW M3x5(+4x0.5-SEMS)	1
20		7742253150-0A	REAR COVER	1
21		7737758650-0A	HINGE+BASE ASSY	1
	21-1	7745105550-0A	AXIS STAND	1
	21-2	7742103970-0A	WASHER-R	1
	21-3	7742103960-0A	WASHER-L	1
	21-4	7748707730-0A	AXIS-SUPPORT	1
	21-5	7742609570-0A	AXIS-WHEEL-R	1
	21-6	7742609560-0A	AXIS-WHEEL-L	1
	21-7	7112701081-0A	SCREW M5-SEMS+4x15-LL	1
	21-8	7285001081-0A	WASHER(AXIS)	1
	21-9	7742001150-0A	NUT M5-7(HNDS24HA015)	1
	21-10	7742609590-0A	STAND-BLOCK	1
	21-11	7482403-0A	SCREW M4x14(STAND-BLOCK)	3
	21-12	7746410053-0A	BASE	1
	21-13	7742200038-0A	FOOT PAD	4
22		5114100017	AUDIO BD	1
23		7140810032-0A	SCREW M4x12(F/C-R/C)	2
24		7742001140-0A	SCREW M4x6(+3)(HNDS24/L-ASS)	2
25		6857104501	SPEAKER	1
26		7141220061-0A	SCREW M2x6(SPEAKER)	4

MATERIAL: SEE TABLE		LITE-ON TECHNOLOGY CO.	
FINISH:			
PROCESS:			
USED ON: M17AAQ		TITLE: M17AAQ EXPLODE DWG	
DRAWN:	DATE:		
DESIGN: Carol Huang	07/23'03	SIZE: A1	DWG NO:
CHECK:			PART NO:
APPROVE:		SCALE: 1/1	SHEET 1 OF 1



REVISION HISTORY

REV:	DATE:

DRAWN : Regina Ni	DATE : 03/14'03	LITE-ON TECHNOLOGY CO.
CHECK :	DATE :	TITLE : K17ANS/ANY HPD-K17AAY INVERTER & POWER CKT.
APPRO :	DATE :	
DESING :	DATE :	SCH NO : 8813580000-01 / SIZE : A2
CHECK :	DATE :	
APPRO :	DATE :	PCB NO : 6832135800-02 / SHEET : OF

ACER AL1502 / AL1702

SCHEMATIC REV 02 PTB-1468

27 April 2004

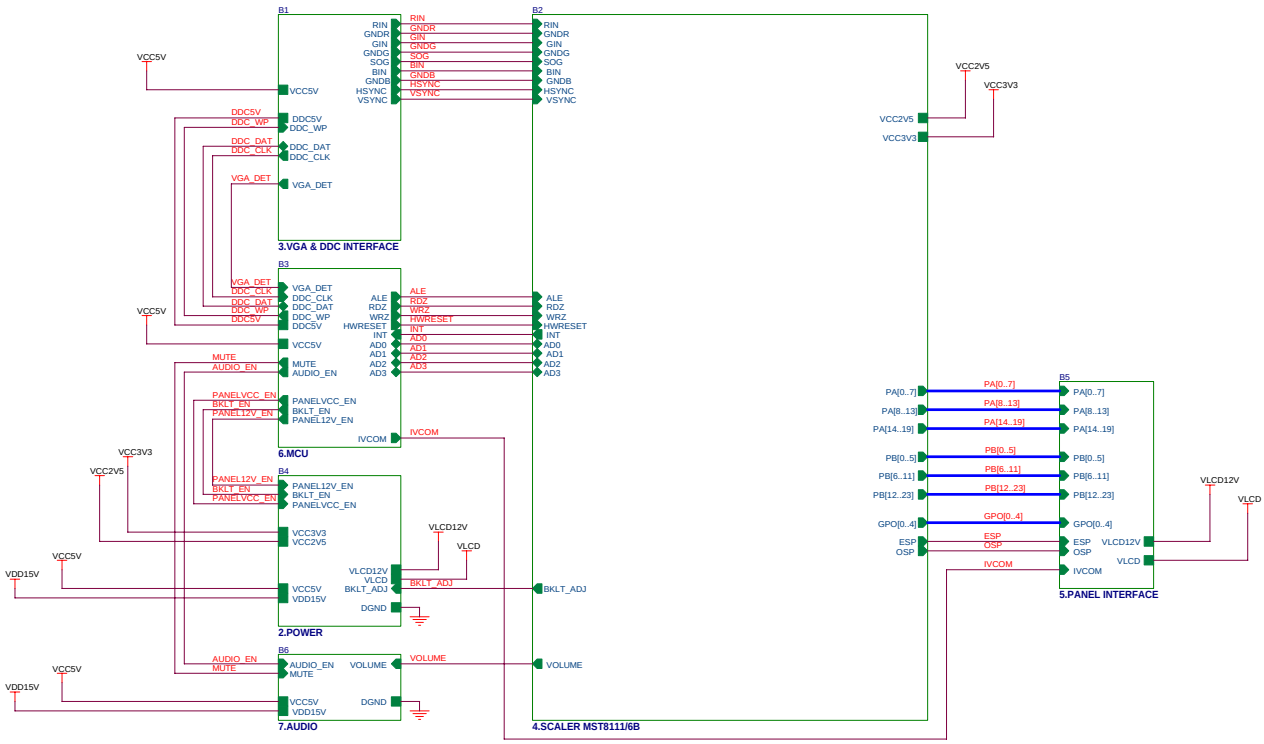
ROAD MAP

DESCRIPTION	SHEET NO.
TITLE SHEET	1
TOP	2
POWER	3
VGA & DDC INTERFACE	4
SCALER MST8111/6B	5
PANEL INTERFACE	6
AUDIO	7

REVISION HISTORY

REV.	DESCRIPTION	BY	LAST UPDATE
02	BASED ON SCHEMATICS FOR ACER	KT.LIN	27 April '04

LITE-ON TECHNOLOGY CO.				Sheet: 1 of 8	Size: Custom
DRAWN:	Date:	DESIGN:	Date:	Title: M15_17AAX TITLE SHEET	
CHECK:	Date:	CHECK:	Date:	DWG.NO: 8814680000-02	
APPRO:	Date:	APPRO:	Date:	PCB.NO: 6832146800-02	



LITE-ON TECHNOLOGY CO.				Sheet: 2 of 8	Size: Custom
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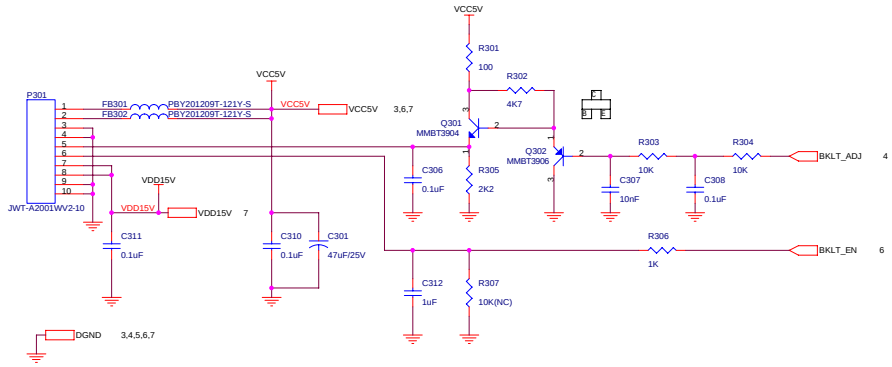
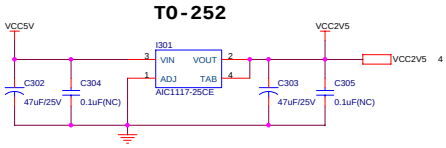
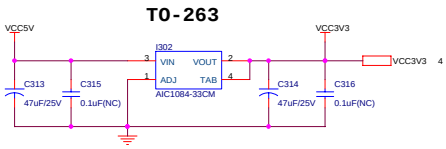
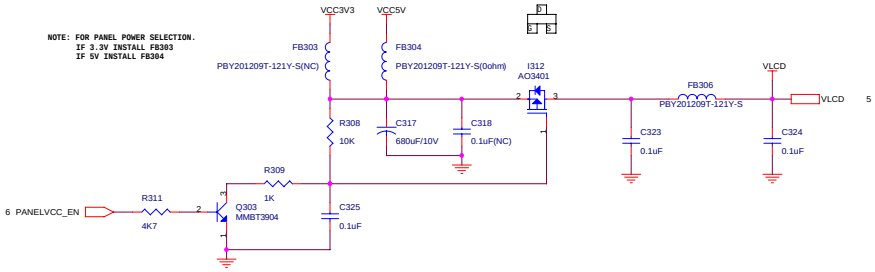
CHECK:	Date:	CHECK:	Date:	DWG.NO: 8814680000-02	
APPRO:	Date:	APPRO:	Date:	PCB.NO: 6832146800-02	

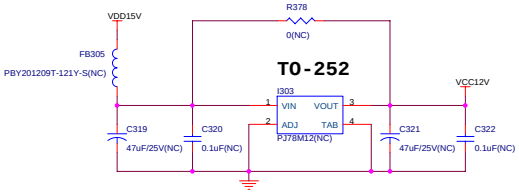


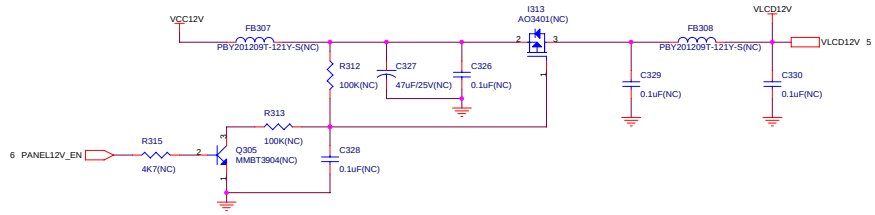






Note : If input power is +12V install R378.





LITE-ON TECHNOLOGY CO.				Sheet: 3 of 8 / Size: Custom
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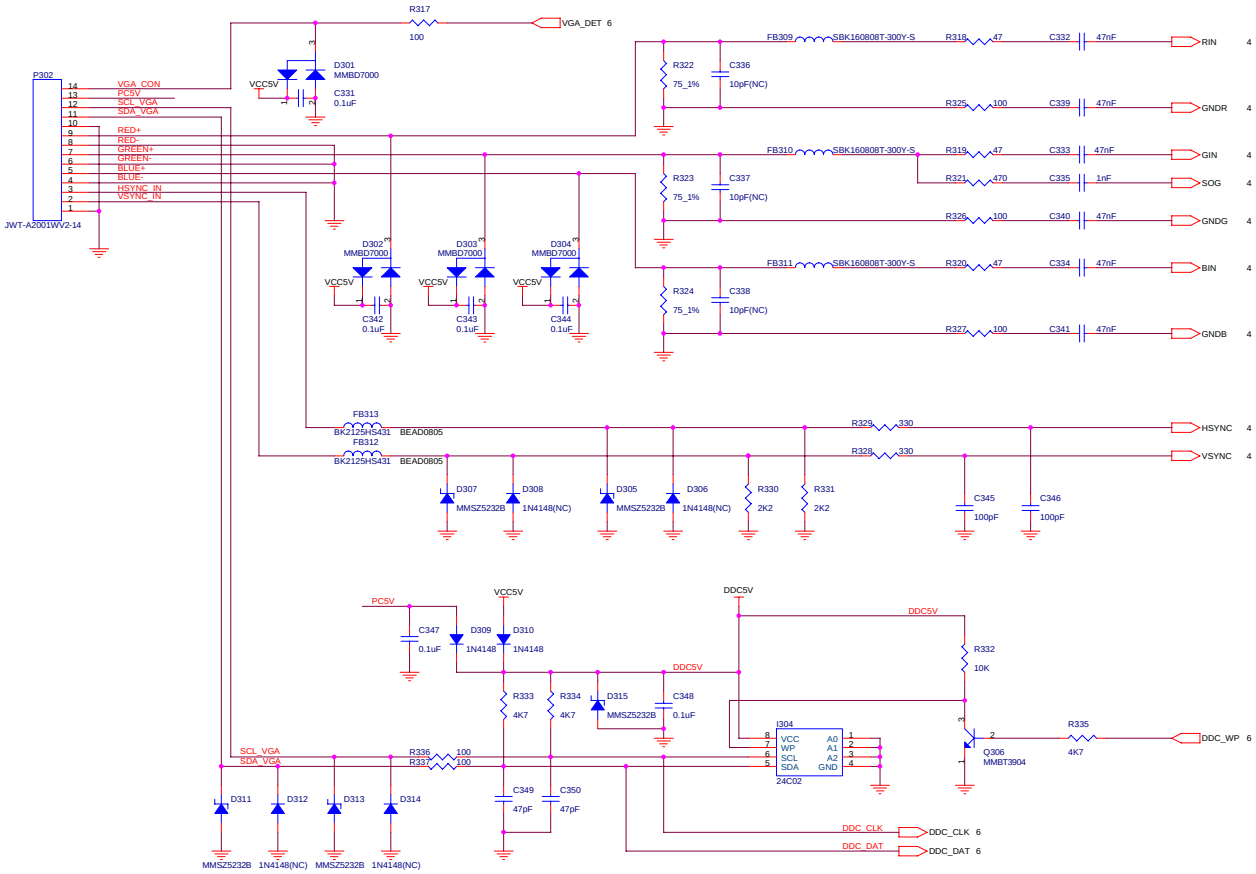
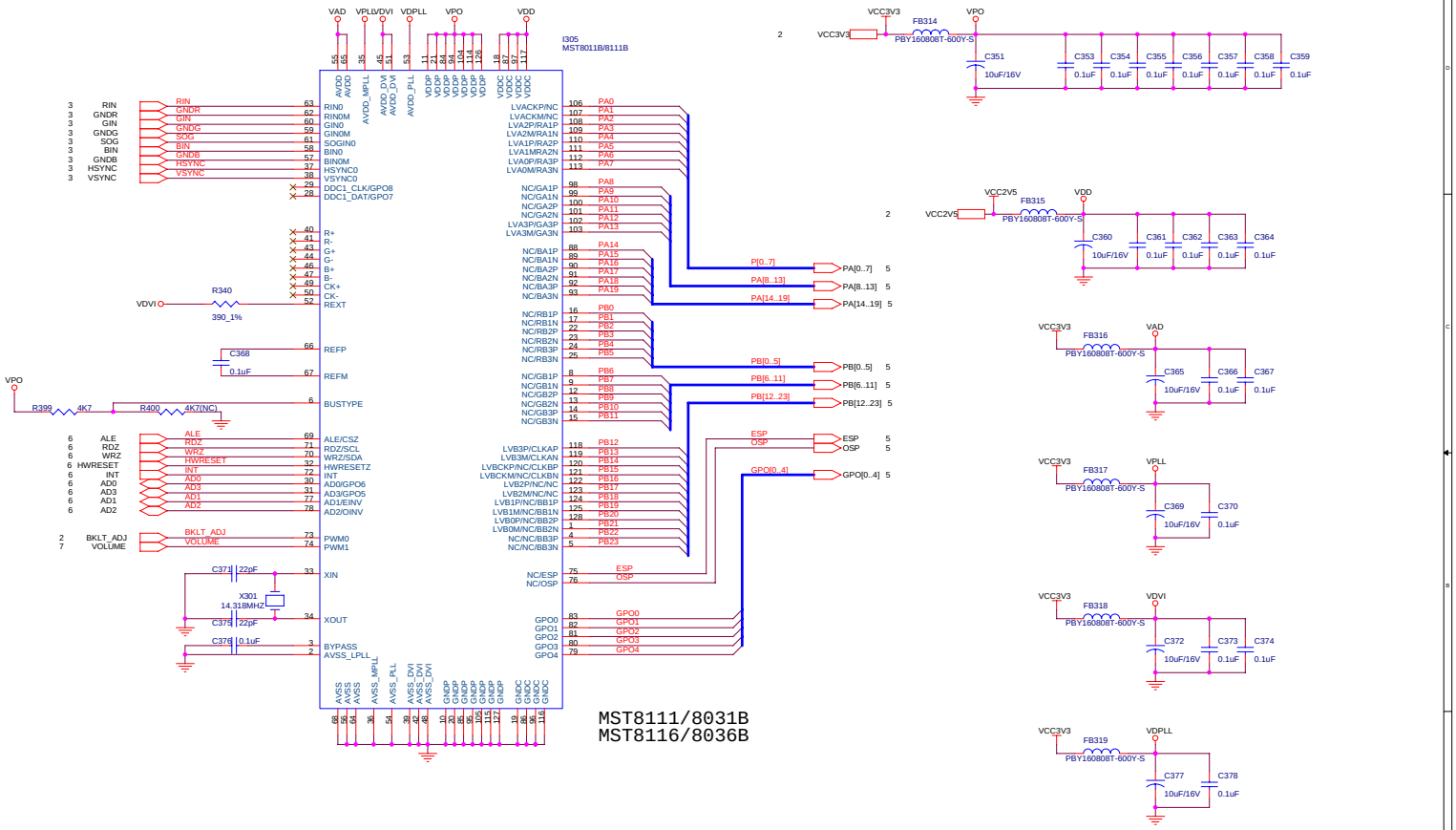
CHECK:	Date:	CHECK:	Date:	DWG.NO: 8814680000-02
APPRO:	Date:	APPRO:	Date:	PCB. NO: 6832146800-02



LITE-ON TECHNOLOGY CO.				Sheet: 4 of 8	Size: Custom
DRAWN:	Date:	DESIGN:	Date:	Title: M15_17AAX VGA & DDC INTERFACE	
CHECK:	Date:	CHECK:	Date:	DWG.NO: 8814680000-02	
APPRO:	Date:	APPRO:	Date:	PCB. NO: 6832146800-02	

NOTE: IF IS 15" (XGA) PANEL, I305 IS SELECT MST8011B.
NOTE: IF IS 17" (SXGA) PANEL, I305 IS SELECT MST8111B.



LITE-ON TECHNOLOGY CO.				Sheet: 5 of 8 / Size: Custom
DRAWN:	Date:	DESIGN:	Date:	Title: M15_17AAX SCALER MST8111/6B
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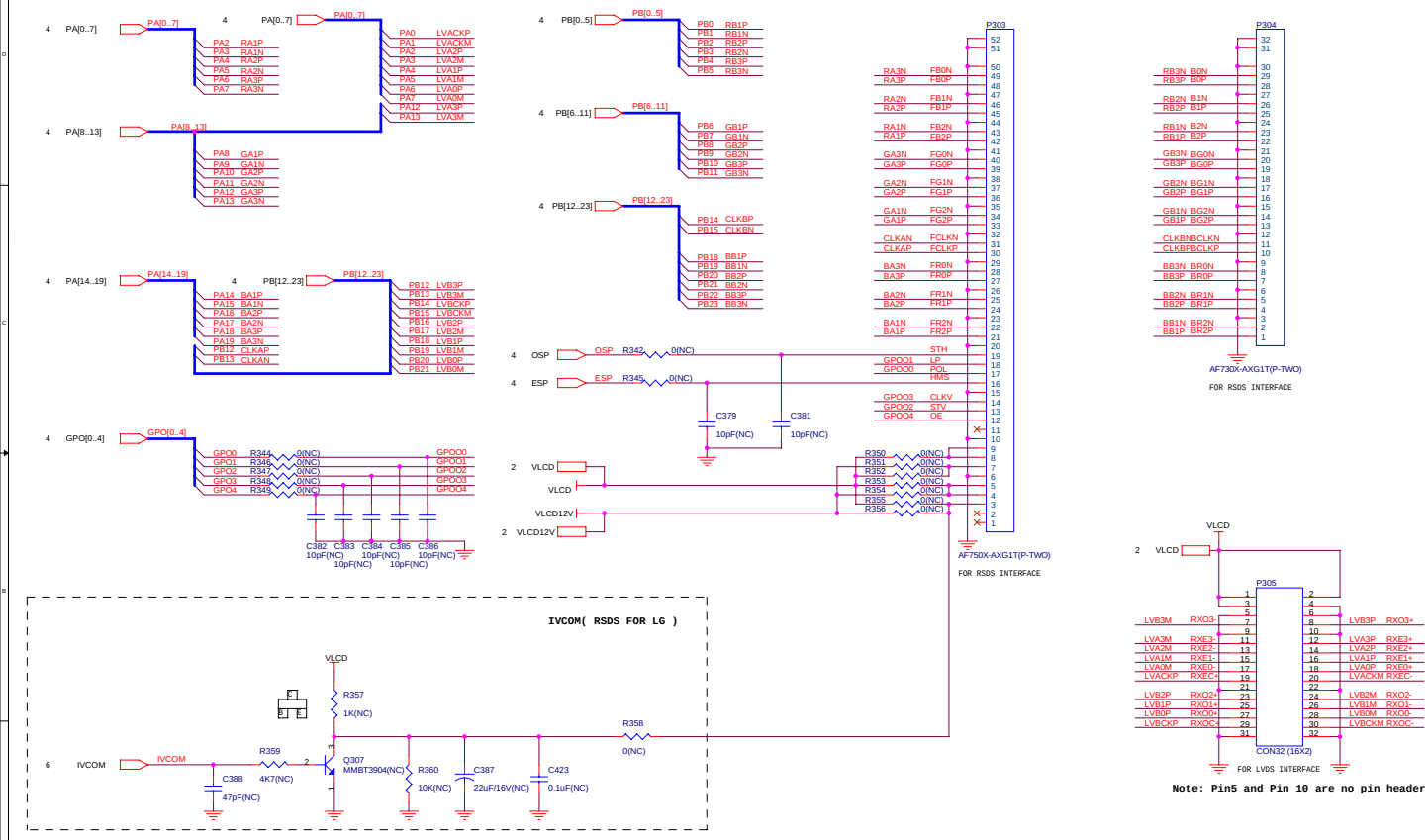
APPRO:	Date:	APPRO:	Date:	PCB. NO: 6832146800-02



Note: Pin5 and Pin 10 are no pin header

	R350	R351	R352	R353	R354	R355	R356	R358
AU 17	NC	NC	5V 0R	5V 0R	NC	5V 0R	NC	NC
QDI 17 CPT 17	3.3V 0R	12V 0R	NC	NC	12V 0R	NC	12V 0R	NC
INNOLUX 15	3.3V 0R	NC	3.3V 0R	NC	NC	NC	NC	NC
HannStar 15 CPT 15	3.3V 0R	NC	3.3V 0R	NC	12V 0R	NC	NC	NC
LG 15	3.3V 0R	NC	3.3V 0R	NC	NC	NC	NC	0R

LITE-ON TECHNOLOGY CO.				Sheet: 6 of 8	Size: Custom
DRAWN:	Date:	DESIGN:	Date:	Title: M15_17AAX PANEL INTERFACE	
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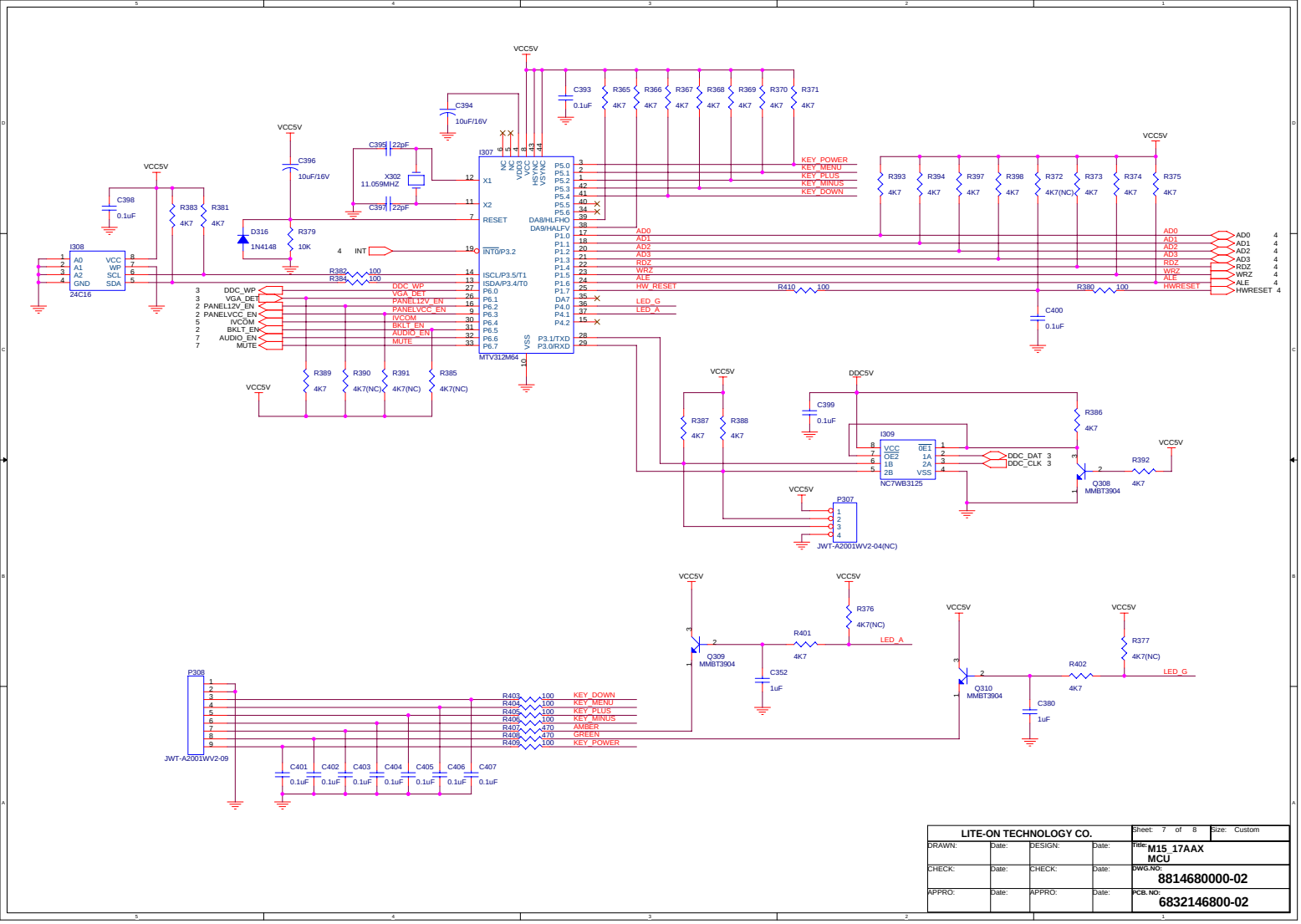

LITE-ON TECHNOLOGY CO.				Sheet: 7 of 8 / Size: Custom
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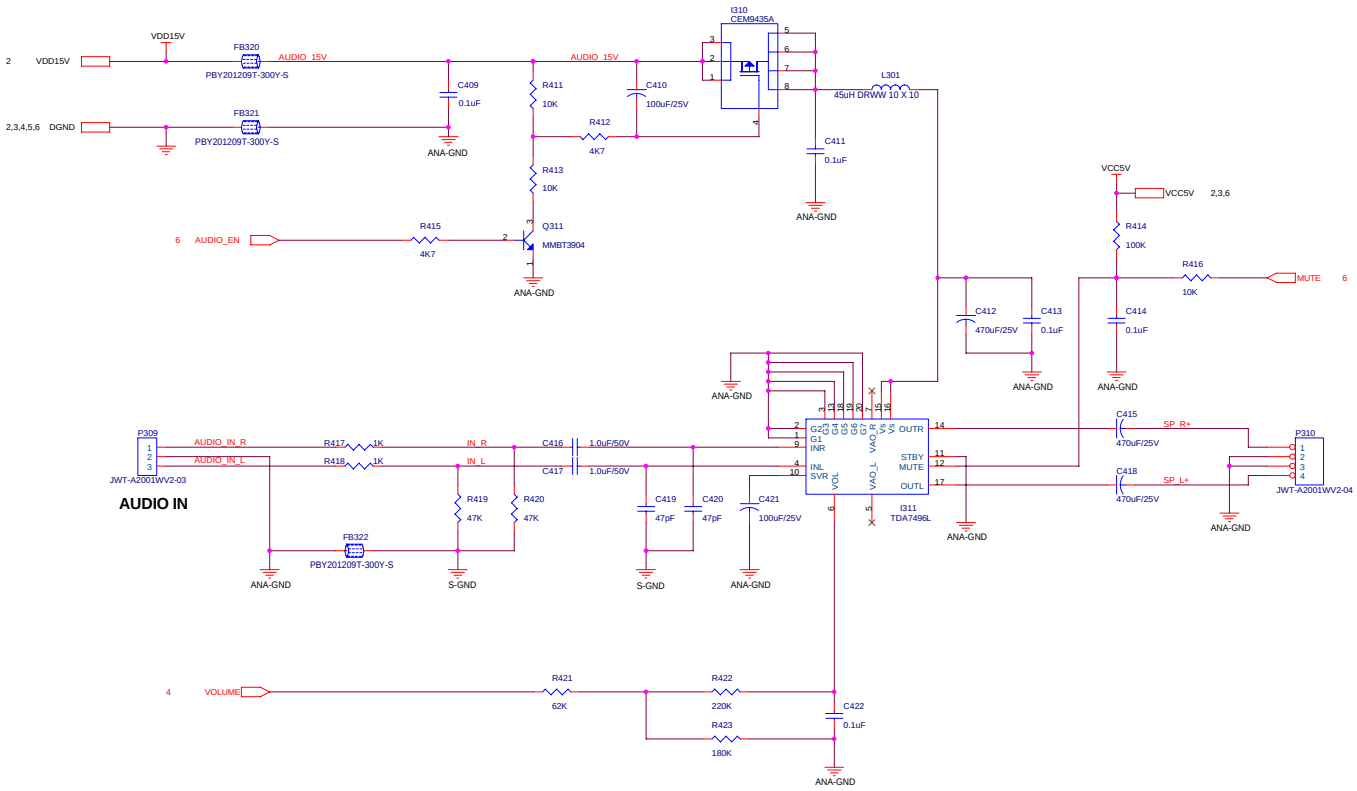

LITE-ON TECHNOLOGY CO.				Sheet: 8 of 8	Size: Custom
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CHECK:	Date:	CHECK:	Date:	DWG.NO: 8814680000-02	
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